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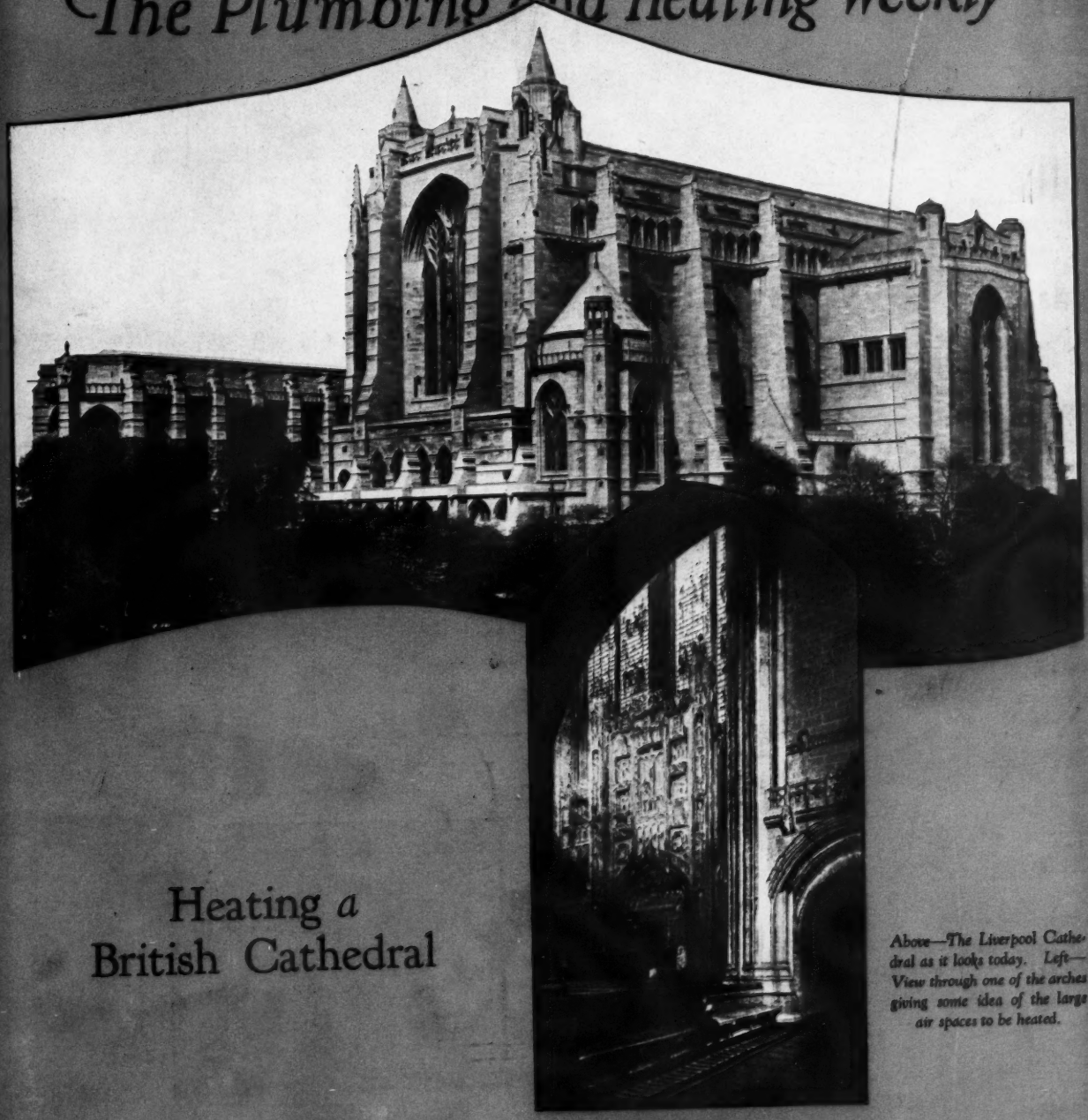
DOMESTIC ENGINEERING

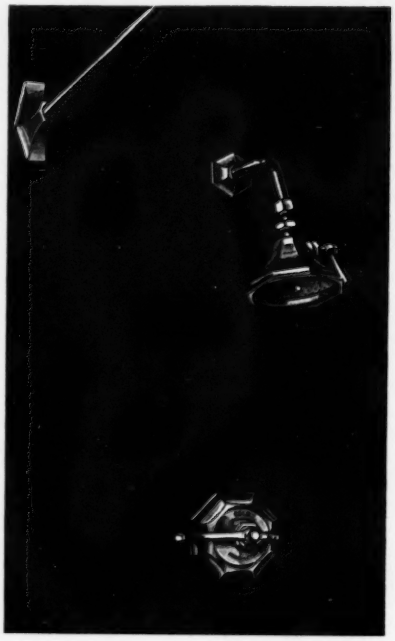
The Plumbing and Heating Weekly



Heating *a* British Cathedral

Above—The Liverpool Cathedral as it looks today. Left—View through one of the arches giving some idea of the large air spaces to be heated.

NOVEMBER 24, 1928



SPEAKMAN *now offers you greater opportunities for profit*

Universally known among architects and Master Plumbers, Speakman Showers are the first choice of the nation for quality and durability.

But Speakman offers you far more than the highest quality shower. It offers you a *complete line* of fixtures for the bathroom—in nickel and beautiful chromium plate—*which match perfectly in pattern and design.*

This is something well worth considering.

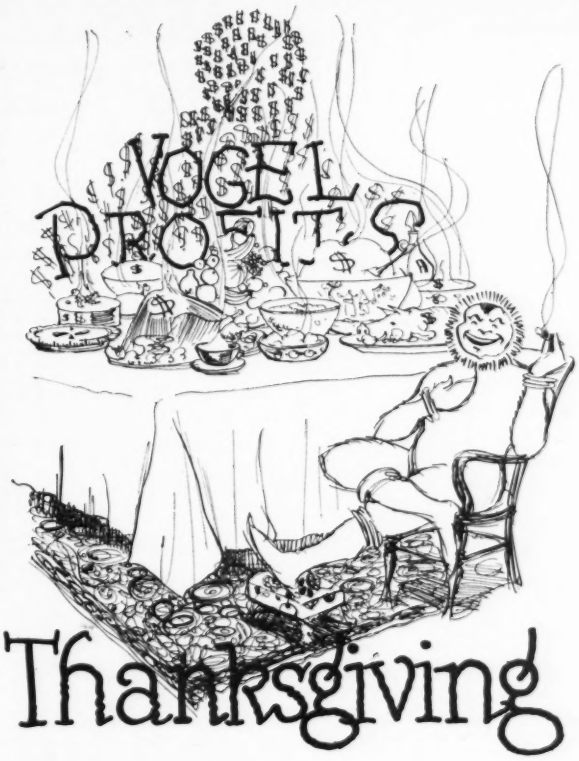
It means that you can offer your customers a set of fixtures for shower, lavatory and tub which are uniform, harmonious and unparalleled in quality. It means that every time you sell one Speakman fixture you have a chance to sell the others which match it.

SPEAKMAN COMPANY, Wilmington, Del.

SPEAKMAN

SHOWERS & FIXTURES

VOGEL *Frost Proof Closet No. 1*



Thanksgiving

This is the season of contentment for the man whose past efforts have borne fruit.

A turkey on the table is only a small part of what **VOGEL** Dealers have to be thankful for. And Thanksgiving day isn't the only day in the year they rejoice. Every time they look in the **VOGEL** Order Book they're ready to celebrate all over again.

That's what handling **VOGEL** products does.

Puts turkey on the table every day in the year—if you like turkey that well.

Jovo

Jos. A. Vogel Co.

Wilmington, Del. **St. Louis, Mo.**

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Gentlemen:—

When your hair is all gone it's too late for Herpicide.

When the gas companies and mail order houses get all the water heater business it will be too late for the plumber to do anything about it.

The plumber can serve the public better and more economically on water heaters than can any other agency. There is no earthly reason why ALL the heater business should not be done through the plumbing trade. It is a business that is worth fighting for. In a short time it will be worth a great deal more.

EverHot Heaters are sold through the plumbing trade only—and we don't mean maybe.

What are *you* doing for the cause?

EverHot Heater Company
5211 Wesson Ave. Detroit, Mich.

FRETZ

NIPPLES

S. S. FRETZ, JR. & CO.
PHILADELPHIA, PA.

DEVLIN

MALLEABLE IRON FITTINGS

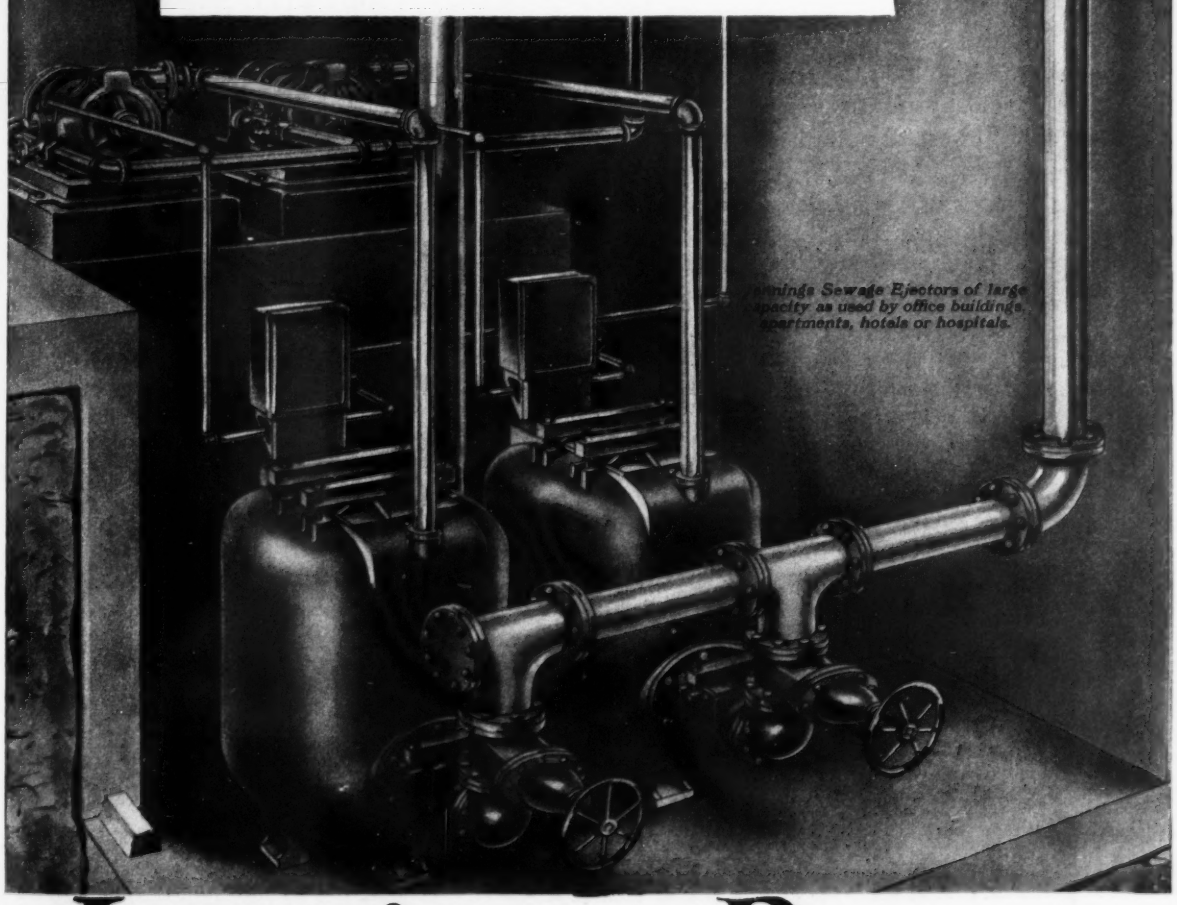
THOS. DEVLIN MFG. CO.
22nd St. and Sedgley Ave., Philadelphia, Pa.

Where toilets are below street sewer

WHEREVER toilets are located in basements below the level of the street sewer, it is good practice to put in a Jennings Sewage Ejector.

Soil, sewage and drainage flow into the ejector pot by gravity. Here such waste matter accumulates until the pot is full; whereupon the sewage is discharged by means of compressed air into the street sewer overhead.

Operation is automatic. Also reliable. There are no inaccessible or complicated parts likely to get out of order or need attention. No screens to clean. No storage basins. Write for full particulars.



Jennings Sewage Ejectors of large capacity as used by office buildings, apartments, hotels or hospitals.

Jennings Pumps

THE NASH ENGINEERING CO 41 WILSON ROAD, SOUTH NORWALK CONN.

Speedily Applied Yet Fine in Appearance

Asbestocel Pipe Insulation Pleases Builders

TWO facts about Improved Asbestocel Pipe Covering recommend it chiefly to the wise plumber and heating contractor—

The first is—the speed with which his mechanics may apply it.

Because of its consistent roundness and hardness, a mechanic can apply Improved Asbestocel in much less time than the same mechanic could put ordinary air cell on the same run of piping. That saved time is money in your pocket.

The second point is—the fine appearance of the finished job.

After all, your finished job either recommends you or tags you or your men as poor mechanics. The even roundness and the clear white color of Improved Asbestocel after it has been applied to the heating pipes of a new home are bound to add to your reputation as a careful workman. That counts heavily, particularly with the builder of houses for sale.

Price?—

Did you know that for the average house the difference in price between good Improved Asbestocel and ordinary air cell amounts to only about a dollar?

If you want more information, ask your jobber, or send the coupon to Johns-Manville Corporation.

Builders and home buyers alike recognize the quality of Asbestocel

MASTER of ASBESTOS

Johns-Manville

IMPROVED ASBESTOCEL

JOHNS-MANVILLE CORPORATION
New York, Chicago, Cleveland, San Francisco
Branches in all large cities
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Please send me complete information about Improved Asbestocel Pipe Insulation.

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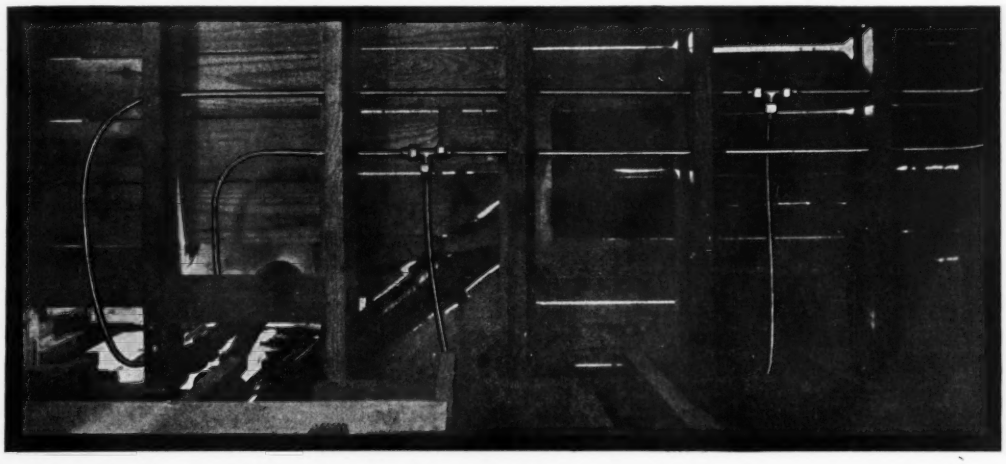


Cutting the tube with a hack saw.

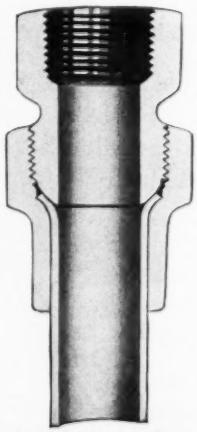
Copper Tube Plumbing with Nibco Compression Fittings

Copper Service Tube is now being used in all kinds of plumbing. The fact that it can be bent into any desired position makes it possible to do intricate jobs of piping with fewer fittings and much less work than with other types of pipe. It is rust-proof, non-corrosive and LESS EXPENSIVE than either brass or lead.

The universal use of Copper Tube plumbing has been made possible by Nibco Compression Fittings, which are manufactured from the best grade of red metal brass castings, and entirely eliminate the necessity of cutting threads or making wiped joints.

A few of the more commonly used fittings are shown here, together with a sectional view of the coupling and the special tool for flanging the tube. Only three simple operations are required to make the connections. If you are not already familiar with this new type of plumbing, it will pay you to send for further information. Just ask for Bulletin 165.

Inserting the flanging tool shown below.



Sectional view of coupling, showing how connection is made. When the coupling nut is tightened, the tube becomes slightly compressed at the point of contact, thus forming a wedge on the end of the tube which holds it firmly in position.

Fig. 101—Coupling Copper Tube to Copper Tube.

Fig. 103 — Coupling Copper Tube to Female Iron Pipe Thread.

Fig. 100 — Copper Tube Nut.

The recessed shoulder on this tool forms a perfect die for flanging the ends of the copper tube. It is made in the required sizes and is absolutely accurate. A hack saw and monkey wrench are the only other tools required.

Fig. 109 — Elbow Copper Tube to Male Iron Pipe Thread.

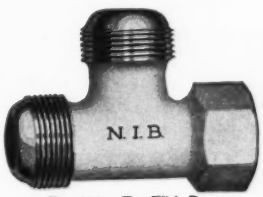


Fig. 114 — Tee With Run Female Iron Pipe Thread.

Fig. 108—Elbow Copper Tube to Female Iron Pipe Thread.

Nibco Fittings are manufactured in 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", and 2" iron pipe sizes

NORTHERN INDIANA BRASS CO.

ROSS MARTIN, President ELKHART, INDIANA *Publishers of "NIBCO NEWS"*

The Choice of Successful Operators

Real estate operators of New York City make certain the success of their buildings before they start work. The buildings are large and must be rented quickly to assure profits.

These operators have found a good friend in Pacific Boilers—equipment that gives heat economically at the lowest possible maintenance cost.

The up-to-the minute New Yorker scans carefully such evidences of value. That is why leading operators use Pacific Boilers. They win tenants and buyers.

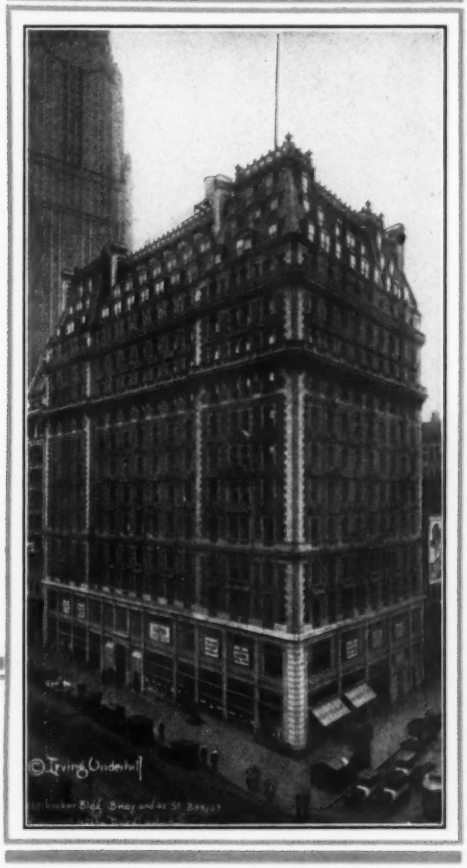
The Park Royal, 73rd Street, New York, shown here, is the fourth of the huge apartments built by the Lapidus Engineering Co., in New York City in which Pacific Steel Boilers were used.

PACIFIC STEEL BOILER CORPORATION
Waukegan, Ill., Bristol, Pa.
Sales Offices in 58 Cities
Division of U. S. Radiator Corp., Detroit, Mich.

PACIFIC
STEEL HEATING BOILERS

which brass pipe should you choose?

Brass is not an elemental material. It is a manufactured product and its capacity for maximum service depends entirely upon the skill, knowledge and experience of the maker.



PLUMRITE brass pipe has been tested in actual use over a long period. Thirty years of service have proved that its composition is practical—that its method of manufacture does guarantee uniformity. Reinstallation in old, built-over buildings has clearly shown its ruggedness.

Other mixtures, with various copper contents, have been tried and found suitable for certain localities, but they bring no advantages to the vast majority of installations. For unusual requirements Bridgeport can supply brass pipes of any desired mixture. But Plumrite is recommended as the most satisfactory pipe under general conditions.

Plumrite brass pipe, is, we believe, as nearly perfect as a brass pipe can be. Time and again, experience has borne out this belief.

Our booklet, "Bridgeport Standard Mixtures," explains the standard brass pipe mixtures in use to-day—and tells when and where to use them. It will be mailed free to you on request. Send for a copy.

A Typical Service Record

In the Hotel Knickerbocker building at 42nd Street and Broadway, New York, "Plumrite" brass pipe was installed when the structure was built in 1895. In 1921, the building was remodeled for office purposes and the piping, after a quarter of a century's use, was found to be in perfect condition. The complete system was retained, and has continued to give absolute satisfaction.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT Bridgeport CONNECTICUT

"MAKERS OF BRASS PRODUCTS FOR OVER 60 YEARS"

You ask for BALANCED INVESTMENT and PERFORMANCE

Apartment Hotel, 180 E. Delaware Place, Chicago
Architect and Engineer: B. Leo Steif & Co. *Heating Contractor:* Schampel & Dougherty

NATIONAL HEATING EQUIPMENT PROVIDES EVEN MORE

WEIGHING first cost of heating equipment against operating expense, the fitter rightly solves the problem by demanding *balanced investment and performance*—and National Products always provide it.

But with National Products you get even more. You find here a comprehensive line of outstanding boiler and radiator products, developed by six great companies. You find a united responsibility that does not quibble or compromise, that is intent only on upholding the standards involved in *National Quality*. You find tremendous manufacturing and warehousing facilities that make deliveries subject to your wishes, rather than to plant limitations. You find strategically located offices, that make *National Service* instantly available when you want it.

Balanced investment and performance—a complete line of boilers and Aero radiation—unit responsibility—unexcelled service—all these are yours, when you handle National Products.

NATIONAL RADIATOR CORPORATION

MANUFACTURER OF RADIATORS AND BOILERS

Nine Plants devoted to National Service through these Branch Offices and Warehouses:

Baltimore, Md.—2600-2622 Matthews St. Boston, Mass.—93-97 Oliver St.
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Indianapolis, Ind.—431 W. Georgia St. Johnstown, Pa.—221 Central Ave.
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Omaha, Neb.—108-112 S. Tenth St.
Philadelphia, Pa.—121 N. Broad St. Pittsburgh, Pa.—1509 Arrott Bldg.
Richmond, Va.—3032 Norfolk St.
St. Louis, Mo.—1042 Central Industrial Ave. Washington, D. C.—2205 Fifth St., N. E.

A Letter from Harry G. Nye

Nov. 24, 1928.

To the Plumbers & Steam-fitters of the U. S. A.

Friends:

We have had so many eat-more-apple weeks and drink-more-raisin days in this country that I am thinking of starting something like that for the plumbers and steamfitters.

Apples are all right, and I like 'em, although I believe onions would keep the doctor away just as well, and farther. But when it comes to health, the plumber and steamfitter beats either one.

What happens when a man wants to take out life insurance? The doctors look at his underwear, peek down his epiglottis, and wrap a piece of old inner tube around his biceps and read his blood pressure.

What the doctors ought to do is to go to a man's house and look down his sink and test his water pressure. What they ought to do is to inspect his sewer system, not his nervous.

They ought to ask him about his bathing habits, if any. The man who is in his tub every Saturday night and in his pew every Sunday morning is a good risk in any man's company.

Instead of asking him "how's your heart?" they ought to ask him "how's your heating plant?" His furniture may be up to date, but how's his furnace? How's his circulation?—hot and cold water, I mean.

An ounce of prevention is worth a pound of cure, and less expensive. What this country needs is birth control, of typhoid germs. A typhoid germ doesn't mind a doctor, but sure does hate to see a plumber come around.

There ought to be one day in the year when nobody was allowed to eat any apples, so the doctor could come around and diagnose the pipes, and write out a prescription for the plumber or steamfitter to fill.

He might even go so far as to insist that Nye Tools be used on the job, so as to be sure of a good one. They work so much better that it would be better for everybody. (And easier and faster.)

An apple a day is all right, but a plumber once in awhile is better yet.

Sincerely,

Harry G. Nye

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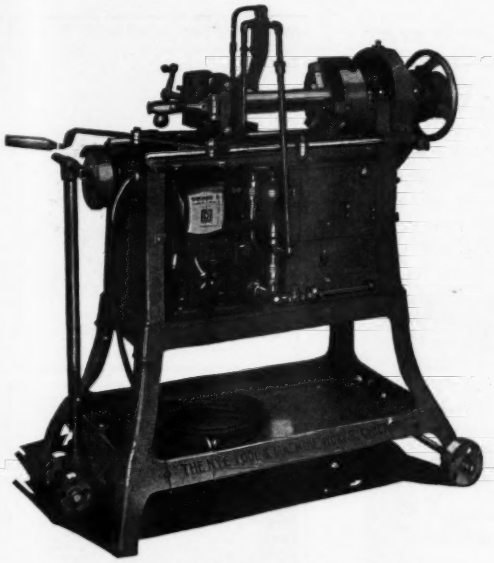
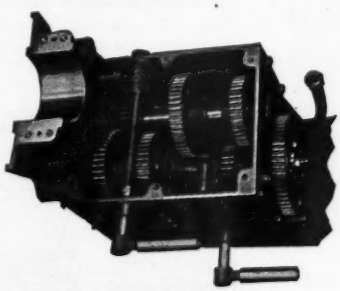
NYE POWER MACHINES

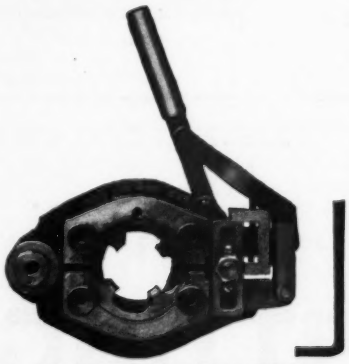
ALL GEAR DRIVEN—NO BELTS OR CHAINS



No. 100—Capacity ¼ to 2 inches inclusive
No. 200—Capacity ¼ to 2½ inches inclusive
When used with Universal Shaft will operate stocks up to 12 inches.



Gear Case running in oil assuring perfect lubrication



QUICK OPENING DIE HEAD
Equipped With Trouble Proof Ring Type Dies
(No Chasers)

OTHERWISE KNOWN AS

THE NYE TOOL & MACHINE WORKS

MANUFACTURERS OF HIGH GRADE PIPE TOOLS

4120-30 Fullerton Avenue Chicago, Illinois

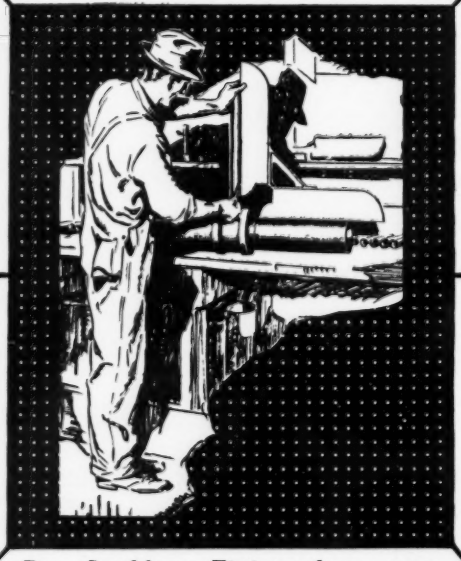
ACCURACY *of Alignment*

Accuracy—unvarying accuracy in every detail of Stockham manufacture is responsible for the accurate thread alignment which makes Stockham Fittings preferred for every pipe line need. Accuracy in selecting raw materials by expert metallurgists, accuracy of pattern, accuracy of molding, accuracy of tapping, accuracy of finish—all are vital steps to produce Stockham Fittings that *save time and money* on the job.

Accuracy of Stockham patterns is the first step in assuring accuracy of alignment

Accuracy of molding from perfect patterns is assured by modern machinery

Steel pins engage the halves of Stockham molds, assuring accuracy of finished mold



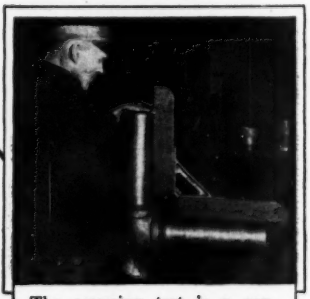
Buy Stockham Fittings from your jobber. His stocks of Stockham Fittings and of all the materials and fixtures you need are maintained for your service. From the jobber you buy with greatest economy. Send for our handy vest-pocket catalog.

STOCKHAM PIPE & FITTINGS CO.
BIRMINGHAM, ALA.

Warehouses
BOSTON NEW YORK CHICAGO LOS ANGELES

Rigid precision machines, set up in accurate alignment, assure accuracy of tapping

In the tapping department fittings are constantly tested for accuracy of alignment



The squaring test is a constant check on the alignment of Stockham Fittings

CAST IRON
Screwed *Flanged* *Drainage*

MALLEABLE
Standard *Extra Heavy*
Oil Country Malleable

ELECTRIC CAST STEEL
Flanged *Screwed*

STOCKHAM FITTINGS

The new trends in plumbing and heating are always discussed in "Domestic Engineering" editorials, and described in its articles.

Between Ourselves

"The merchandising field is a broad one; let's go into it wholeheartedly and become real salesmen." —L. J. Kruse, California State president.

Imagine the problem of a heating contractor having to install a system of such magnitude that 80,000 square feet of radiation are found necessary to be sure of complete warmth during the cold months. Such a problem confronted the builders of the tremendous new cathedral at Liverpool, Eng., photographs of which are shown on the front cover, and the heating system, strangely enough, instead of being ultra-modern, reverts to the type used in some of the buildings of ancient Rome.

Your Editor

THIS cathedral is one of the largest in the world, and compares favorably with Old World cathedrals in architecture, while surpassing them in mechanical details. It is so large, that if it were attempted to heat it with ordinary radiation, it would resemble a radiator warehouse or showroom. For that reason, other methods of heating the cathedral had to be devised, and the article "Heating a British Cathedral," by A. W. Barnes, tells about the heating system used. While few heating contractors are presented with the problem of furnishing heat for so large a building, perhaps the method used will become popular for other types of buildings.

AS WINTER starts its slow but sure approach, we begin to think of the heating system, the coal, gas or oil supply, the radiators, the weather stripping and all other factors which keep our homes warm enough on the coldest of days. Year in and year out, Winter comes; then goes on its way, leaving us a brief period of temperate weather until Summer beats down on us with its hot sun. When it arrives, we don't look over the house for the cooling apparatus, with the possible exception of dusting off the electric fan. But in the future, such a procedure may be just as customary. In the meantime, we have ventilating systems in some homes, and an article in this issue called, "Air Conditioning in a Modern Residence," describes an installation in a home.

NEW PROBLEMS, new solutions, new amusing incidents, all based on facts, greet us again this week in the "Dolan & Olson" story. These two partners in the business of selling plumbing and heating jobs to reluctant customers have variegated experiences, and Jerry has a great gift in telling us about them in the manner he does. These stories have become so much a part of the industry that everyone is looking forward to them, and sometimes it is regrettable that these two are in business, and so are too busy to give us as many stories as we would like. Read this one. It's good.

"YOUR fine letter with the data for which I asked arrived today. I certainly want to thank you for it. It is exactly what I wanted, and represents a thorough time study of this matter."—So writes P. A. Johnson of Kansas City, Mo., in referring to an answer "Domestic Engineering" made to one of his technical questions.

IN about two weeks, the annual New York Power Show is to be held in that city. Manufacturers of plumbing and heating equipment have for some years maintained exhibits at this exposition. This year, however, the retailer part of the field—namely, the Heating and Piping Contractors National Association—is also maintaining two booths. The purpose of these booths is to show the development of engineering standards under the sponsorship of the organization, to explain the advantages of certified heating, and to point out the reliability of association members. The retailers in the industry are ever on the alert for new methods to show that they are alive to modern business necessity.

COPPER tube plumbing, while not new, has become more popular recently through the production on the part of manufacturers of compression fittings. On account of the new way of joining copper tubing, it has been more useful in plumbing installations, and some master plumbers are advocating it instead of other kinds of pipe. In this issue an article called "A Copper Service Tube Plumbing Installation," by Ross Martin, describes an actual installation made in a home in Michigan City, Ind. Read about the use of copper tubing in plumbing.

WITH the advent of skyscrapers, new problems in heating and ventilating present themselves. No two buildings are exactly alike in their requirements, but each gives ideas of how such installations should be planned. In the next issue is an article by Samuel R. Lewis on the heating and ventilating of one of Chicago's new skyscrapers, the 42-story Mather Tower.

The man who is so busy that he does not have time to read his trade paper is like the man who was so busy chopping wood that he did not have time to sharpen his axe

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DOMESTIC ENGINEERING

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Chicago, Illinois
November 24, 1928

OBSERVATIONS

Who Got It?

According to the Harvard analysis of the operating expenses of wholesalers of the Middle West, the net loss on the total of $106,000,000 of business done by these wholesalers was 0.6%. $636,000 was lost. Who got it?

The possibilities are numerous. Perhaps the general contractor got it, although his voice has been raised in protest against profitless times. Perhaps the architect shared in it. Undoubtedly the financial men behind larger projects reaped a part of it. Poor credit extension absorbed some of it.

As an example it might be well to examine one big project. Manufacturer and wholesaler made no money —perhaps lost it—by reason of the prices quoted. The contractor may or may not have made a profit. If competitive conditions permitted him to add a bare 5%, he was operating on a slim margin and probably the "breaks" of the job cost him money. At any rate it seems certain that this $636,000 was not poured into the pockets of the plumbing and heating contractor.

The question as put is, perhaps, unimportant. It would be more to the point to inquire what is to be done about it.

A Challenge

The Harvard analysis is a direct challenge to the industry. Over half a million dollars, which might have been "ploughed back" into the industry has gone to enrich others. To continue under such methods means, of course, further losses for the industry. If building projects can not be planned to include a reasonable profit for the plumbing and heating industry, such projects might better be left alone.

Lack of knowledge of costs is indicated as largely responsible for this loss. Presumably the first step will be the installation of adequate cost control methods. Once a knowledge of costs is available, the industry must accept the challenge and begin to claim its rightful return for services rendered. If a profit is to be made on the industry's service, why not claim it for the industry?

Raise the Qualifications

There are, it is said, too many retailers in the industry. That is probably true. The practical remedy is, of course, open to the industry: Raise the credit qualifications for becoming a retailer. This will eliminate the "Man Friday" who is able to enter and continue in business only because he has the use of the wholesaler's capital, in the form of too-easy credit. Let credit be extended upon the only sane basis—a man to be entitled to such accommodation as his own capital situation warrants. Credit should be based on resources, not on mere promises to pay, nor on the wholly problematical profit from a current job. When a man who applies for credit can show an accumulated capital, he has furnished the first evidence of creditworthiness. It means that he has already demonstrated his ability to make a profit—to earn a return on his services sufficient to enable him to meet operating costs and yet lay up a surplus which, invested in his business, becomes his justification in asking credit. Under present conditions credit qualifications are too low—and sometimes non-existent. Naturally the matter of raising the qualifications for becoming a retailer in the plumbing and heating field includes more than credit-worthiness. To raise the general qualifications will be the work of years, involving an extension of the trade school idea and general educational requirements. We touch upon credit qualifications as an immediate remedy to produce immediate results. They should be raised to relieve the industry of the burden of losses resulting from abnormal credit practices.

Basis of Credit

ULYSSES OF TRADE

Plumbing and heating seem prosaic enough—a matter of calculations, pipes, fittings, radiation, pressures —all very practical. Yet there is a fascination in listening to some of the older members of the industry. What the trade school offers these days, the older men had to seek in travel. There are men in the industry who have worked in many a city—men whose work, done during the days when they traveled about seeking experience, is perhaps still doing service thousands of miles from the cities in which they finally settled.

Travel, it is said, is the best education. It is a school which issues no diploma, but it has equipped men in our industry with the very practical knowledge which comes of contacts with many men and many cities.

Residence of H. W. Wendt, Buffalo, N. Y.

Air Conditioning *in a* Modern Residence

IT IS predicted that by the simple turn of a switch many homes soon will be cooled in summer as they are heated in winter, as the result of new developments in ventilation.

What the science of ventilation has achieved in cooling and air conditioning theaters, public schools, hospitals and office buildings, is to be applied to the home in providing the comforts of ideal air conditions in all seasons regardless of the climate outside.

Already the scientists have developed compact air conditioning units for the home and are striving to bring down the costs of installation and operation to make it an every-day practicability. On a smaller scale than on big building jobs, they have hooked up powerful little ventilating fans with refrigeration and the household heating plant so that any temperature and humidity desired, with a slight motion of air, can be obtained. In several cases where these installations have been made, exhaust fans also are used in kitchens, basements and attics to carry out odors, dampness and excessive heat.

A system of mechanically controlling air conditions in the White House recently was installed at the suggestion of President Coolidge, while systematic air conditioning is provided in the homes of such famous persons as Edsel Ford, J. P. Morgan, Joseph Pulitzer, Samuel Insull, Senator Reed, H. L. Mencken, T. H. Maytag, A. A. Busch, Mme. Amelita Galli-Curci and others. Many new apartment buildings in Chicago, New York, Cleveland, Detroit, Buffalo, Boston, Milwaukee and other cities are being provided with air conditioning or mechanical ventilation and landlords are featuring it for its sales appeal.

Torrid temperatures reported throughout practically the entire United States during the summer of 1928, and particularly the heat experienced in the large cities have stimulated renewed research in the subject of home cooling. In addition to the activities of the research laboratories of a number of ventilating equipment manufacturers, several of the universities are conducting experiments and studies. Professors C. W. Good and J. E. Emswiler of the University of Michigan, announced that the university's department of engineering research has started tests which are expected to have definite influence on the immediate future of home cooling.

Squads of students will be placed at given tasks in a room where the condition of the ordinary home exists and their bodily and mental reactions, as the atmosphere becomes increasingly stuffy, will be observed and recorded. Then the test will be repeated in a room ventilated by the fan-driven cool air. Headaches that occur, speed and accuracy of work, the fatigue of the young men and women, and the steadiness of their nerves at various stages of the comparative tests, all will be recorded to find out whether freely circulating air is actually better for the human body than stale and stagnant air.

The results of scientific studies indicate, also, that the

roofs of houses and buildings in the future will be made with reflecting surfaces, because it has been found through studies of various types of roofs that heat absorbed by and through a roof can be considerably reduced by painting or covering the surface with a reflecting surface. It is also interesting to discover that the heat-absorbing qualities of a roof can be greatly decreased by sprinkling the roof surface with water.

Air conditioning for residences is really much further ahead than the general public or even most heating and ventilating contractors and engineers realize. Installations were made twenty-five or thirty years ago consisting of supply fans with indirect heating surfaces, distributing ducts, and air filters, and between 1910 and 1920 many fine residences were built with similar combined heating and ventilating systems. One of the influences during the latter period was the desirability of using a spray system for washing the air, and at the same time controlling the humidity. Air washers had been recently improved, and the use of humidity control made living conditions more healthful and prevented the drying out and cracking of furniture and woodwork.

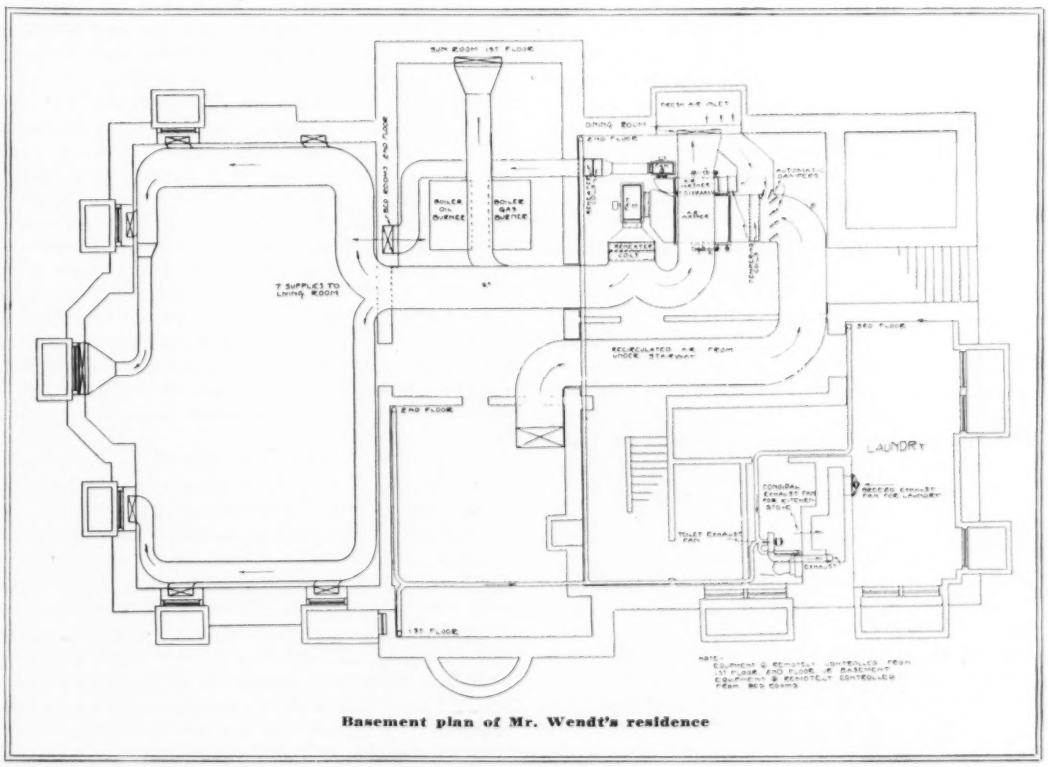
These installations were confined to the distinctly expensive type of houses. While their number has very greatly increased in the last ten years, it is natural that the added cost should limit their use to those residences which are not only built for a range of costs distinctly above the average, but which are also designed by or for people who have an appreciation of the advantages to be derived.

The public today demands in the home improvements and conveniences which would have been thought quite unnecessary, if not in fact impossible to obtain a short while back. Even an approach to the present comfortable temperatures was rare a little over a generation ago, while proper ventilation or regulation of humidity were simply not considered.

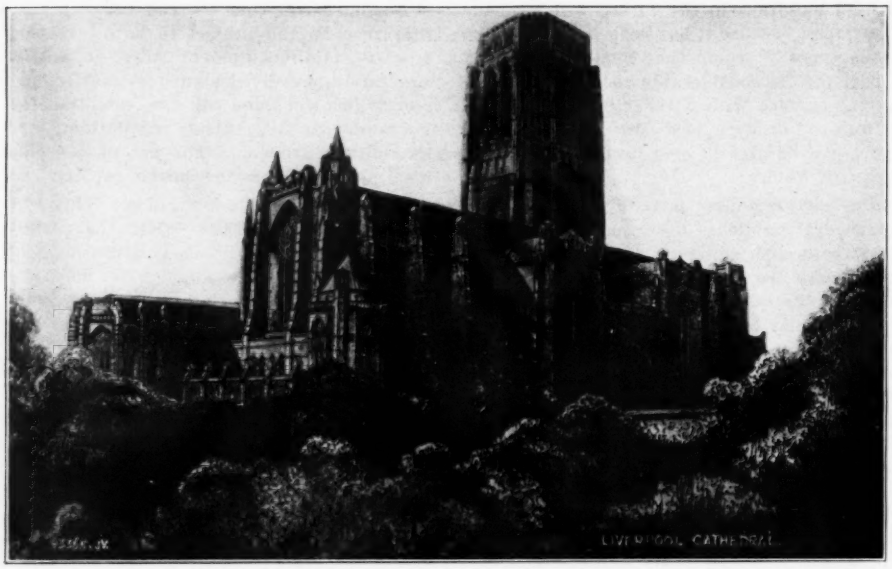
Anyone hardly has to read between the lines of recent literature on the subject to be aware that it is possible now to obtain equipment which is not in any sense an adaptation, but is designed primarily for residence use, and which includes all the essential features and advantages of mechanical ventilation, air washing, and humidity regulation. The use of concealed radiation in its present form is increasing rapidly.

The rapid introduction of unit heaters for industrial buildings leads to the belief that small unit heaters, lighter and more compact than anything now on the market, may become common for individual rooms. We already have such unit heaters for school rooms and offices, and yet such units with perhaps fewer refinements in the way of air filters, temperature and humidity regulation, will offer a method of heating and ventilating the average residence, while for the larger and more expensive class of homes, a modification of the central supply system will be best suited to afford thorough air washing and humidity for the living apartments.

An example of the latter will be found in a residence ventilating system installed in the house of H. W. Wendt of Buffalo, N. Y., illustrated in this article. It is also interesting in view of the extent to which mechanical air movement has been depended upon. As the basement plan shows, there are two air supply systems, each with its individual tempering and reheating coils and an air washer. One system supplies the living room, sun room and a large hall, and has a recirculating duct from the latter. The other system supplies sleeping rooms on the second floor with outdoor air washed and tempered to any predetermined point, and making it unnecessary to sleep with windows open to a zero atmosphere, burdened with the weight of clothing which such a temperature would require. The boilers are of the cast iron sectional type, and oil fired. An air washer with dewpoint, automatic humidity control, conditions the air.



Basement plan of Mr. Wendt's residence



Liverpool Cathedral. This article describes how it is heated

Heating *a* British Cathedral

By A. W. BARNES

THERE are many magnificent buildings in England, of which the British people may well be proud; and among such edifices the new cathedral of Liverpool, now in course of construction, will certainly have a foremost place when the entire project is finished. At present, rather less than one-half of this glorious building has been completed, dedicated, and brought into daily service for the observance of religious ceremonies.

Only a short while ago, a famous author, whose reputation is world-wide, was walking, with a number of his friends, through the completed portion of the cathedral, turning to one of the party he exclaimed, "This building is a poem in stone!" Such it undoubtedly is; indeed it is more. Not all poems are cheering; but Liverpool cathedral, by virtue of its design, its red-sandstone, and its oak, is a poem of structural warmth and cheerfulness.

The bishopric of Liverpool was established as recently as 1878; and in 1900 Dr. Chavasse became the second bishop of the diocese; as a result of his efforts the Liverpool cathedral act was passed by parliament in 1902, and shortly afterwards members of the architectural profession were asked to submit preliminary designs for a new cathedral. One hundred and three architects sent in their suggested designs, and from these five were chosen by the advisory architects—Messrs. G. F. Bodley, R. A., and R. Norman Shaw, R. A., to send in designs appropriate to the site chosen. The successful final designs were sent in by an architect who was then only twenty-one years of age; he is now Sir G. Gilbert Scott, R. A., and his fame is world-wide.

Although the great war greatly hindered progress, work on the cathedral has been continuous for the past twenty-five years, and the money spent amounts approximately to five million dollars. At least another twenty years of labor, and the expenditure of an additional five million dollars will be needed to complete this beautiful, sacred structure.

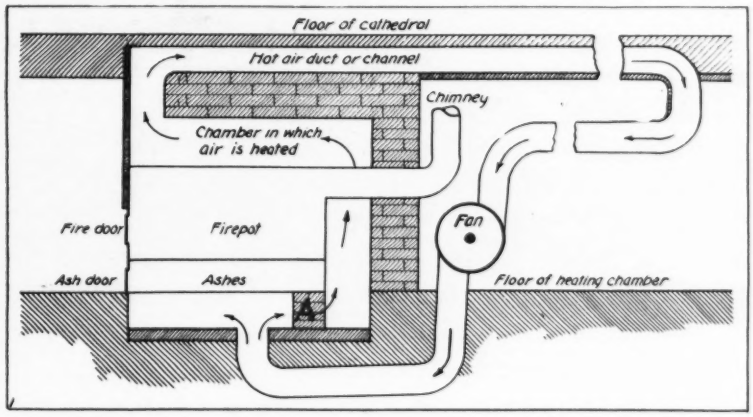
Many interesting features and details are incorporated in this new cathedral, and particulars concerning a number of these will be given towards the end of this article. But the somewhat unusual methods that were adopted for the warming and ventilating of this enormous structure are of outstanding interest generally, and of exceptional interest to heating and ventilating engineers.

The cathedral stands 158 feet above the sea level, on a hill which overlooks the river Mersey. The open sea is not far distant, consequently the building is exposed to prevailing winds. The total floor space covers an area of 100,000 square feet, and the height of the main portion of the interior varies from 116 to 173 feet. From the foregoing particulars, it will be clear that the successful warming of the cathedral presented the heating engineers with a number of difficult problems; but so successfully have these been solved, that the warming of the completed portion of the building is said to leave nothing to be desired. This highly satisfactory result is due to the combined efforts of the architect and the heating engineers, they having worked together in overcoming the difficulties with which they were confronted. In fact, the warming of this extensive building indicates most clearly that the architect and the heating engineer must work together if large buildings are to be warmed successfully; and in addition, it is a noteworthy example of the excellent results which follow such combined efforts.

Had the cathedral been warmed by the methods generally adopted, its beautiful interior would probably have resembled a radiator showroom of enormous extent; the piping system necessary would also have presented something of a problem. By the methods adopted, approximately three-fourths of the building is successfully

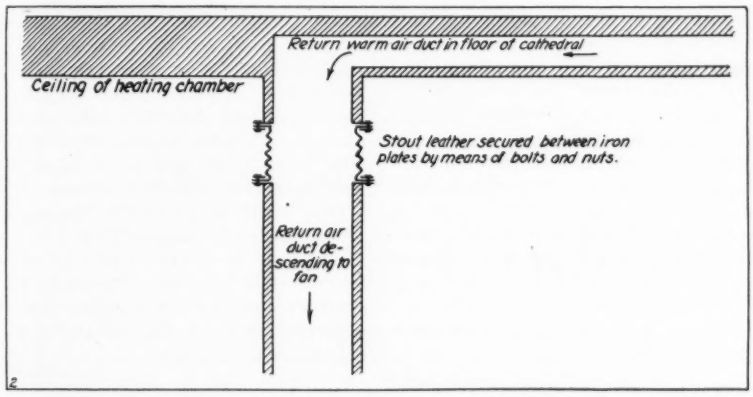
warmed without pipes or radiators; the remaining fourth is warmed by radiators that are heated by a low-pressure hot water apparatus.

The main portion of the cathedral is warmed by a method which, although rather unusual, is certainly not new, it was, in fact, in a rather crude form, employed by the Romans of old to warm their dwellings and public buildings. By means of currents of hot air that are confined to, and are also continuously circulated through channels underneath the floors, about eighty thousand square feet of floor surface is made to serve as a number of extensive horizontal marble radiators, having a low temperature; this eliminates the disadvantages that would be associated with a greatly improved system has been adopted; in this system the products of combustion are conducted direct to the open air by means of a separate chimney which has no connection with the ducts and channels used for the conveyance of the currents of warm air which serve as the circulatory heating medium; this warm air circulates and re-circulates through ducts and channels which are formed in the concrete and are sufficiently air-tight for all practical purposes. The air is not changed, so that practically the same air is kept circulating continually, by means of an electrically driven fan, whenever it is necessary to warm the building.



To the right: Fig. 1.—A sectional view illustrating type of apparatus used in the Liverpool Cathedral. The sketch is not in exact proportion and details are omitted, as the intention in this and the following drawings is merely to describe the character of the apparatus. "A" indicates the supporting brickwork. In this brickwork there are openings through which the air currents pass

Below: Fig. 2.—Sketch showing method employed to eliminate sound and vibration. The sketch is not proportionate and details are omitted


Return warm air duct in floor of cathedral
Ceiling of heating chamber
Stout leather secured between iron plates by means of bolts and nuts.
Return air duct descending to fan

This air warming apparatus is really much the same in principle as a low-pressure hot water heating apparatus, except that rectangular channels and ducts serve instead of the usual metal pipes, and a furnace or stove for heating air serves instead of a boiler for heating water. Fig. 1 is an illustration of the system. There are main, and branch, flow and return ducts or channels, and much skill and ingenuity had to be exercised in order that all parts of such an extensive floor area should be raised to an even temperature. Throughout the winter, the best results are achieved by raising the marble floor to a temperature of 70 degrees F., which, being 20 degrees lower than the temperatures of the human body, is not sufficiently high to be uncomfortable to the feet. Moreover, the long wave length, non-luminous heat, radiated from the floor having a temperature of 70 degrees F. is found to give an internal temperature of about 59 degrees F., this gives the maximum degree of comfort to the congregation owing to the fact the internal atmosphere has only 10 per cent less humidity than the outside air. Air, owing to its relatively low specific heat compared with its volume, is far from being an ideal medium for conveying heat, consequently a large quantity has to be forced, at a high velocity, through the ducts and channels in order that the necessary quantity of heat may be imparted to the whole of the floor area.

The electrically driven fan, which keeps the air circulating, is connected to the larger of the main return ducts at a point near to the furnace which provides the heat; the internal area of these ducts is about twelve square feet. Under the main floors, numerous ducts and channels are formed in reinforced concrete, these have an area of about 190 square inches. Over 2,100 tons of cement con-

pipes that might leak or become air-bound. The Lady Chapel, Chapter House, Ambulatory, and the Vestries, are warmed by radiators which derive their heat from low-pressure hot water; in most cases the radiators are of a special design which harmonizes with the general features of the interior of the building, and also provides what may be termed an upright flue between the sections; the air currents passing up these flues result in the radiators becoming more effective heating agents than would otherwise be the case. These radiators furnish another instance of benefits which result from the working together of the architect and the heating engineer.

Large radiators of the ordinary type are fixed in the Triforium, and under some of the larger windows, in order that down drafts of cold air may be effectively prevented.

When the Romans warmed their dwellings and other buildings by means of flues or channels in the masonry, they allowed the heated gases and other products of combustion to serve as the heat-conveying medium, the result was that the flues or channels soon became coated with soot which impaired their efficiency considerably, and made frequent cleaning necessary. In Liverpool cathedral

crete and 49 tons of steel reinforcements have been used in that portion of the heating system that is already completed.

The electrically driven motors run almost without noise, in fact such machinery could not run more smoothly or more quietly. Yet the fact that the motors and fans were in operation, was formerly noticeable in the cathedral; to overcome this drawback, the motors and fans were fixed on a shock-absorbing base made of a composition which is largely composed of cork, and the vertical ducts were altered below the cathedral floor, by cutting out a short section, a few inches in length (just under the level of the heating chamber ceiling) and inserting in place thereof, a short section made of strong leather, as shown in Fig. 2.

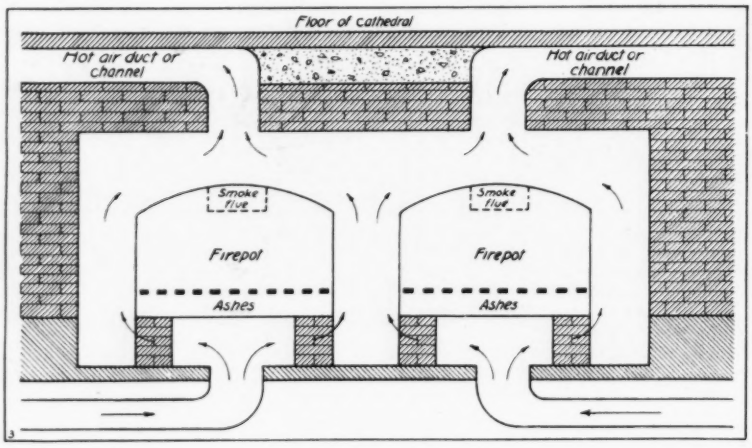


Fig. 3.—Cross section of furnaces or stoves for heating the air that warms the floors of the cathedral. Air passes through openings in the supporting brickwork

The extensive heating chamber is situated under the central portion of the cathedral. In this chamber are installed the low-pressure hot water heating boilers, and three furnaces or stoves for heating air; two of the stoves heat the air that serves for warming the cathedral floor; the third stove is used to warm the air which is necessary for satisfactory ventilation. The furnaces or stoves which warm the air are of quite simple construction, the inner part being a strong iron box which forms the fire-pot, this is enclosed in a larger box built of brickwork, there being an annular space between the outside of the iron box and the inside of the brickwork, and through this space the fan forces the air, which becomes heated during its passage through. Fig. 3 is an illustration showing a cross section of these stoves. It will be noticed that the air ascends between the two fire pots, and in so doing receives heat from both. Open passages through the supporting brickwork allow the air to pass freely around the sides and ends of the fire pots also.

In the Triforium galleries are twenty-two large radiators, each being built up of 21 sections. These radiators are heated by hot water, and being situated more than seventy feet above the floor level, they warm the upper volume of air, and effectively prevent unpleasant downdrafts.

Air for ventilating purposes is drawn by fans through shielded inlets placed near the floor level; it is discharged through openings in the masonry about ten feet above floor level. These air currents ascend vertically from the openings.

Although the height of the interior of the cathedral is considerably over 100 feet, yet, as the result of the warmth given out by the floor and by the radiators in the Triforium, aided by the warm air currents supplied for ventilation, carefully made tests have revealed the fact that there is no difference whatever in the temperature of the air at heights varying from 5 feet to 100 feet above the floor level; and even when the Triforium radiators are purposely allowed to remain cold, there is never more than a difference of 1½ degrees in the temperature of the air at levels varying from 5 feet to 95 feet above the floor level; these are results of which the heating engineers may well be proud. The tests were made during severe winter weather. A separate hot air furnace or stove warms the air used for ventilating pur-

(Continued on Page 73)

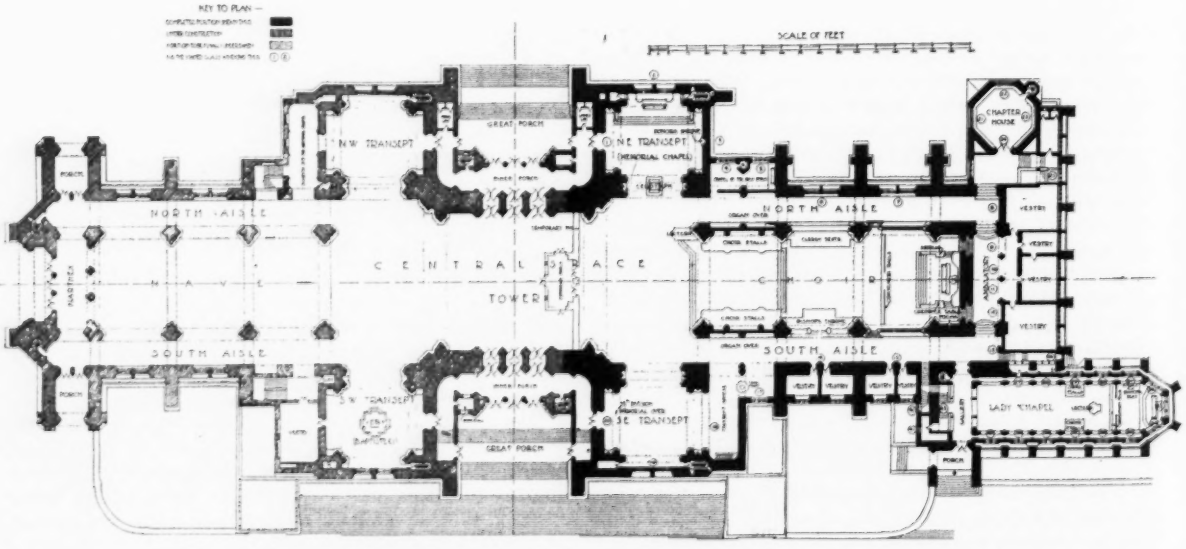


Fig. 4.—Plan of Liverpool Cathedral. The heating chamber is under the central space

Hank attends a "No-decision" meeting

On the job with

Dolan & Olson

ME AND HANK been stepping and we don't mean maybe. Just seems as if in spite of everything that a fellow can do, sales letters, newspaper ads, personal visits and everything else, that people just will not pay any attention to their heating equipment until after old Jack Frost has knocked on the door at least once and then they want service—and how!

And at the same time, they all get the notion that they need new bathrooms and sinks and laundry trays at just about the same time and it sure keeps a fellow stepping high, wide and handsome in his attempts to satisfy the demands that are made upon him.

We picked one that was a jim dandy. A sort of a girl's club bought a big, old fashioned mansion for a club house and late in the spring the heating boiler developed a leak. Fortunately the heating season was just over, so nothing beyond an inspection was attempted at the time.

But along in July they asked for quotations on the necessary repair parts and we found that the parts would cost almost as much as a new boiler, so we quoted both ways and also suggested that they snap into a decision so that the plant would be ready when wanted.

TOO MANY COOKS

'COURSE that sounded like a lot of bunk to be talking heat when Old Sol was delivering more than we wanted and could use, so the girls delayed action and in the meantime a couple of months passed. Along came a cold, wet day and they started thinking about heat.

Talked it over at a meeting; went home and told their dads about it, and right away several of the dads dropped their daily tasks and became heating engineers. One wanted the old boiler repaired (not even considering the fact that the sections would have to be made and that it would require five or six weeks to get them); another wanted a new boiler of a certain type (no particular reason); still another wanted a boiler of another make (his brother happened to be working for this particular boiler concern); and one or two others had certain hazy ideas as to what was required and what they would recommend if they were consulted.

All in all it made a pleasant party. So we quoted on all of the various boilers. Then the girls each took sides, just about in the same fashion that a boy becomes a Rotarian because his dad is or was a Rotarian, and they talked boilers in and out of their meetings and in person and by phone to us, until finally some of the officers wanted one particular boiler and others of the group wanted still another and the treasurer said that she would not pay for any boiler except the one that she wanted.

Then a couple of cold, snappy nights and the mothers began using the phone wanting to know why we were not installing that heating boiler and blaming us for the fact that the girls were catching cold. In spite of the fact

that we told each and every one of them that we would be tickled pink to install a boiler, providing some one would give us a written order showing exactly what boiler was wanted, it was still apparent that it was all our fault that the dear girls were catching cold.

In fact it looked for a time as if we would be sued for not furnishing heat. And finally the girls must have had a decision meeting because the special delivery mail carrier followed us in through the front door bright and early on a Friday morning, with a special delivery letter that contained an order and a request that we speed up the installation, and that they would pay us a bonus for getting them heat in a hurry.

Hank stepped on it. Switched a crew from one job over to this one; ordered a boiler and got the promise of delivery within two hours (and the shipping clerk made good on the promise); phoned the junk man to bring a couple of huskies and get the old boiler (and with a couple of sledge hammers they made that old boiler into scrap iron so quick that the chap that made it must have turned over in his grave comparing the time that it took him to make it and the time that it took these birds to unmake it); the crew, plus a pair of good strong laborers, set up the new boiler; the fitter and his helper made the piping connections; one of the plumbers installed the indirect heater and the connections to the hot water tank and ran the supply line to the boiler; the sheet metal man slapped on a smoke pipe; and shortly after the lunch hour on Saturday the boiler was making steam.

And did those girls appreciate it? Well, I hope to tell you that they did. It was one of those cold, rainy fall days when the cold just eats right in through the summer garments and the old house felt cold and clammy until the steam began to circulate through the radiators. Made a lot of noise, of course, but there was heat with the noise and pretty soon the air valves were spitting steam and the radiators spreading heat and before the boys got packed up to leave the house-keeper yelled down the stairs, "For the luv o' Mike, shut off that heat. The radiators are jumpin', the windows are open and it's hot enough for a bunch of South Sea Islanders."

The best part of it all was that we didn't have to charge them for any over-time because the boys had stepped on the gas and come out ahead of the estimated time and the girls were so overjoyed that they mailed us a check in payment before we had time to make out the bill.

A REVERSE COMPLAINT

GOT a call to make some repairs on an old time combination hot water and hot air heating outfit. The big cast iron water coil in the firepot was leaking and to put in a new one we had to take down almost the entire furnace.

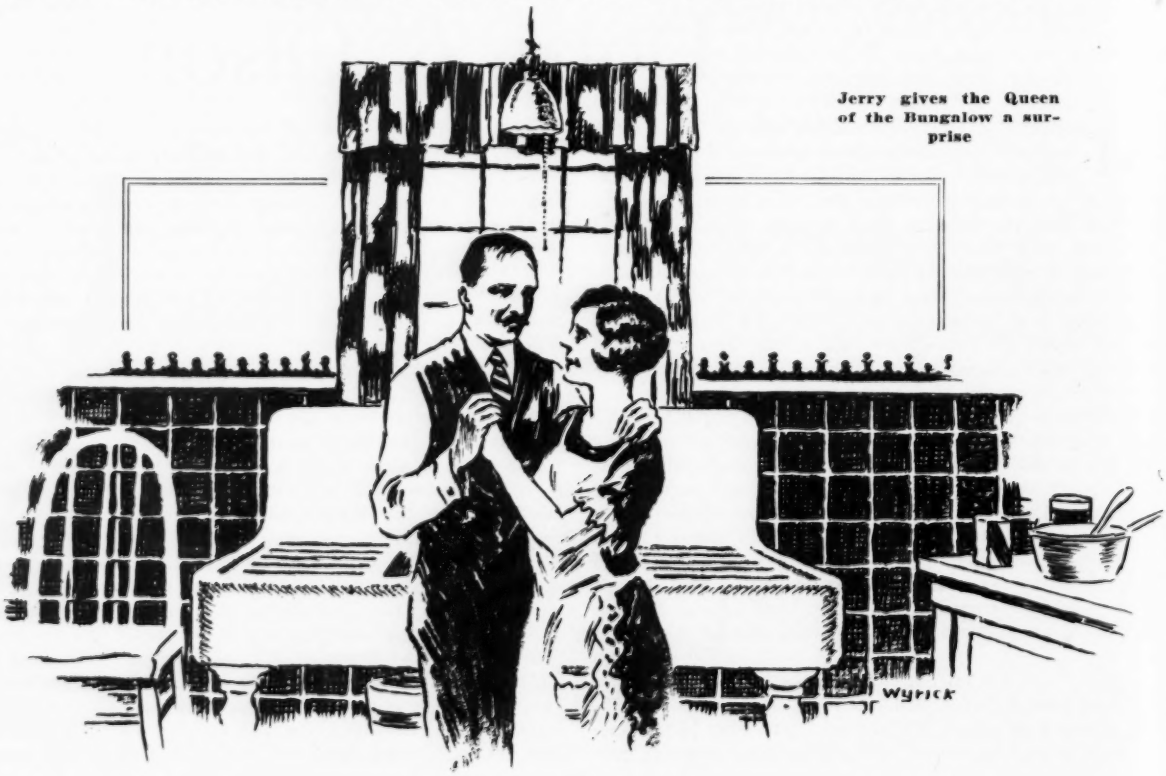
And in putting it together again, we replaced a lot of the sheet metal parts and installed a new smoke pipe, using the old damper and the check draft.

Everything tested out O.K., and Me and Hank felt that we had done a pretty good job, although we would have preferred to make junk of the whole contraption and then install a complete hot water plant, but the owner liked that combination and as he was the boy that was paying the bills we had to obey his orders.

But a few days after the job had been completed we got a rush call from this old bird and he put up an awful holler because he was only burning a little fuel and getting a lot of heat and he told us that the dampers were just exactly in the same places that they had been in before we had made the changes and replacements so there must be something wrong.

Well, there was. We had taken out about ten bushels of soot and ashes from the insides of that old prehistoric monster.

So we told him about that and told him to check the fire still more and to go light on the coal shovel



Jerry gives the Queen of the Bungalow a surprise

because that would mean less work with the ash shovel also.

Kind o' funny to be cussed for saving fuel for a man.

And another bird with a queer twist who was strong on the coal shovel and weak on the ash shovel burned out a couple of grate bars. We replaced them and told him to keep the ash pit clean and in a couple of months he burned out a couple more and then yelled like a stuck pig because he felt that the bars must be defective, although we had to use a bar to loosen up the ashes enough to get into the ash pit and remove the burned grates.

He wasn't burning enough coal

JERRY SELLS HIMSELF

BUT IT'S all in a lifetime, and Me and Hank are going to keep right on sawing wood because every once in a while something really good happens and that makes up for all of the kicks and cuffs. For example a fellow gave us a ring and told us that he wanted to surprise the wife with a new sink so I went out and looked things over. He had one of the old time roll rim sinks with a couple of wooden drain boards and a lead trap and waste pipe that had been getting the worst of it every time the floor was scrubbed.

He didn't know what kind of a sink he wanted, but he had plenty of kitchen wall space (something that we don't find in very many kitchens) so we sold him a double compartment drainboard sink, the largest one made, with a beautiful chromium plated swing spout sink faucet and a trap of the same material. We pulled out the old waste line and replaced it with a new line in the wall and, boy, I'm telling the world it just made a fellow feel like peeling off his coat and tying on an apron and telling the cook to bring on a flock of dishes for washing and drying. You know the comfort of such equipment.

Then, too, this chap bought a new white enameled gas range and between the new sink and the new stove and the refinishing of the wood work and the painting of the walls and ceiling that room was simply transformed.

And you know I felt so good about it that when I got home, the sink in my own kitchen looked like thirty cents and without saying a word to the Queen of the Bungalow I took some measurements, ordered the biggest sink that would fit into our kitchen, sent it out and had it all connected during one of the days that she was attending sewing circle, and she sure was one surprised girl when she popped into the kitchen that evening and feasted her eyes on that new snowy white sink.

To Cool in Summer and to Heat in Winter by the Use of Gas

PLANS to erect a new type of dwelling house, heated and cooled by the same gas fire, are being developed by the American Gas Association.

The projected house is normal size, with probably eight rooms, for experimental purposes. Its location has not been fixed, but is likely to be in the Middle West.

The objective is to work out the possible economic practicability of houses heated and cooled by processes which now exist mainly as laboratory experiments.

The windows of the house will be used for daylight, but not for ventilation. The plan is to make them airtight except for such occasions as window washing. The doors will be somewhat of the bank-safe pattern, of stepped edges in sufficient numbers to be virtually airtight.

One reason for the window-closing is a laboratory discovery that in an artificially regulated room a random draught such as might stray through an open window can cause virtual rain in the room. Ventilator ducts are planned to care for foul air at all times.

Reduce Heating Requirements

Another novelty is insulation of the entire house, calculated to require about 30 per cent less heating energy than in a similar uninsulated dwelling. The insulation will be equivalent to the protection afforded by one and a half inches of cork.

It may be chosen from any one of thirty materials, ranging from eel grass from Boston harbor to bits of paper mashed and sprayed on by air gun, with sodium silicate as a binder. The paper insulation would reach a depth of about three inches.

The ultimate objective, heating and cooling with the same gas plant will not be attempted at the start, says the announcement. The heating and the cooling plants at first will be separate, but it is planned finally to combine them in one plant.

Base Tests on Use of Ammonia

Underlying the experiments the scientific principle is based on the use of ammonia, the boiling point of which is 27 degrees below zero.

In cold weather this property of ammonia will be used to absorb heat from the less cold air outside. In summer it will be used by a reversed process to absorb heat from the warm interior of the house.

The absorption process from outdoor cold does not supply all the heat in winter, but the investigators hope to find a way to make it add appreciably to the warmth supplied in the ordinary way and so reduce the amount of fuel consumed.

For summer cooling hope of success rests on the fact that a small temperature reduction is sufficient to moderate extreme warmth.

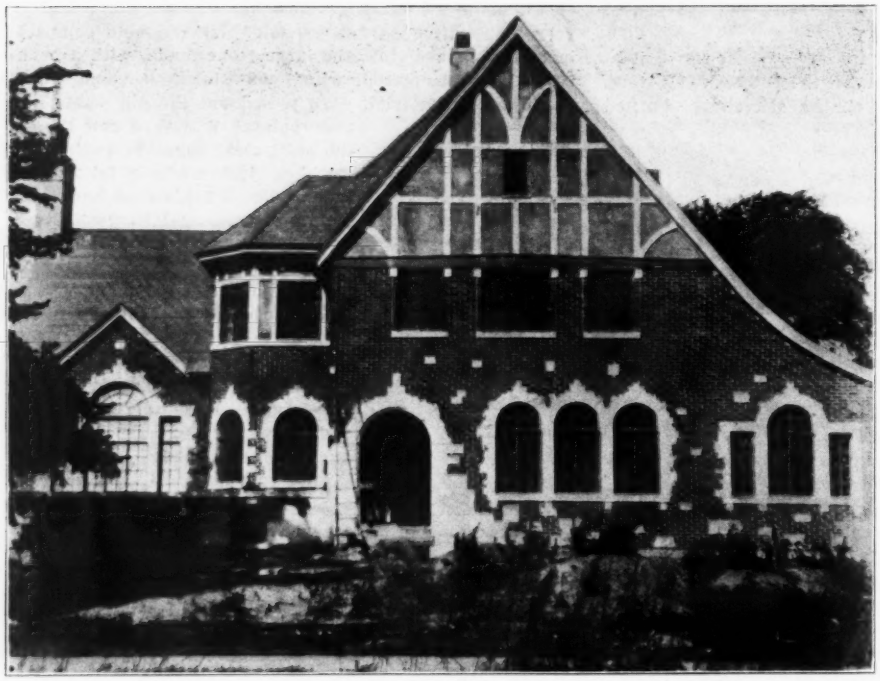


Fig. 1.—The residence in which copper service tube was used

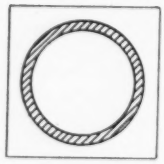


Fig. 2.—Actual size cross section of ¾-inch copper service tube

A Copper Service Tube Plumbing Installation

By ROSS MARTIN

IN THIS article is shown a picture of a fine residence in Michigan City, Ind. (See Fig. 1.) It has many interesting heating and plumbing features which may be described in another article, but this article is devoted largely to one angle of the plumbing installation, and how it was handled. This is the use of copper service tube and compression fittings throughout for water services. This is one of the several dwellings equipped in this manner by Simpson & Adamson, plumbing and heating contractors of Michigan City.

Copper tube for plumbing is not new. It has been used in some parts of the country for several years for street work as well as for plumbing in dwellings. Recently,

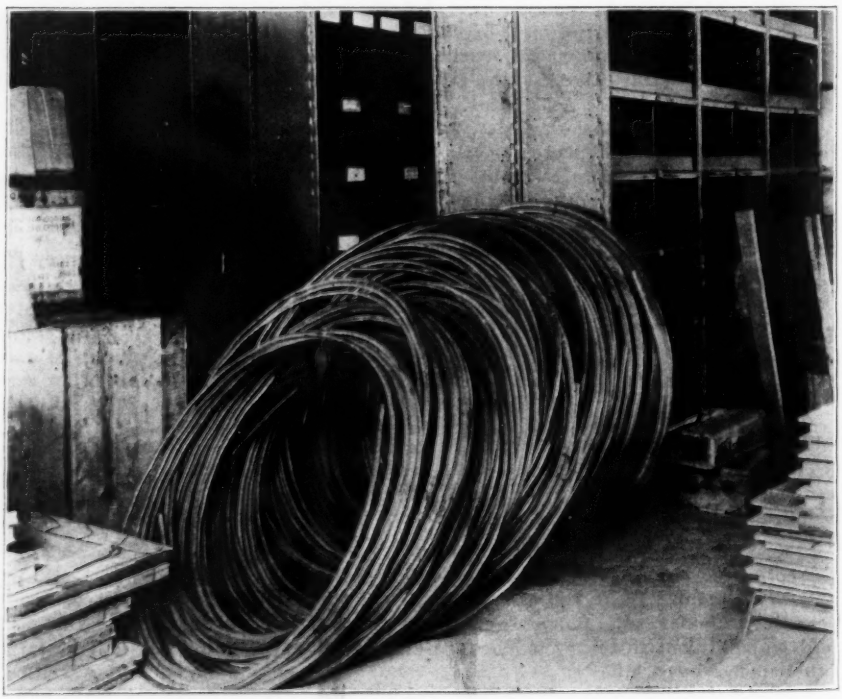


Fig. 3.—Copper service tube as received from the jobber

however, several concerns have added to their lines the compression fittings for copper service tube, and this has given an impetus to the use of copper tube for plumbing.

A plumbing installation does not start when the truck arrives on the job. First, there must be a plan for doing business, a place of business, equipment of tools, supplies, etc. So it is proposed to start the description of this installation with the acquisition of the materials that were used on the job.

A quantity of copper service tube was ordered from the jobber. This is seen in Fig. 3. The tube mills usually make this tube in 30-ft. lengths, although it may be had in 60-ft. lengths, if desired. The tube is soft-annealed, and comes in coils about 4 ft. in diameter. The sizes from 1¼-inch up come in straight lengths. These are limited to 20 ft. for convenience in handling and shipping.

The tools used in connecting copper tube are a hack saw, a file, a monkey wrench, a flanging tool for each size of tube used, a 2¼-pound bronze hammer, a jack knife for reaming, or a reaming tool of some kind, and a can of oil. The fittings are of red brass.

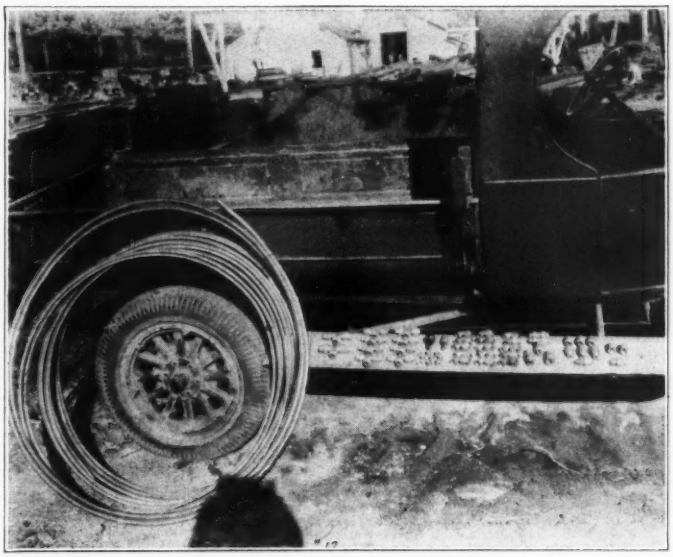


Fig. 4.—Copper service tube and fitting used in this installation

Fig. 4 shows a truck of the plumbing and heating contractor ready to start out for the plumbing job in this two-story, two-bathroom dwelling. The copper tube used in this dwelling is shown on the side of the truck and the fittings used are shown on the running board. The copper tube shown consists of 180 ft. of ½-inch and 15 ft. of ¾-inch copper service tube, and on the running board are 48 compression fittings, as shown in the illustration.

All iron pipe sizes on these fittings are standard. The figures in the following table (See Page 28) have been adopted as standard by the tube mills.

How the Tube Was Handled

When the journeyman arrived on the job for the installation in the residence shown in this article, the first thing he did was to unroll a section of tube. He then fitted it to the space required. He did not take accurate measurement, for, on account of the flexibility of the tube, it was not necessary. When the proper length of tube was unrolled, the journeyman cut it off with his hacksaw, as shown in Fig. 5. He then squared off the end of the tube with a file, and scraped out the burr with the jack knife. Because it is easily bent, the copper tube accommodates itself readily to inequalities of the ground or wall surfaces.

Fig. 5.—A journeyman at work on a street connection

In the next operation in his preparation for making the connection, the journeyman slipped a tube nut on each end of the tubes to be connected. Then the two flanges were made with a flanging tool, adapted to the size of pipe used. The tool is shown in Fig. 6. This tool is designed to give correct taper to the flange on the end of the tube in order to insure proper setting. The flanging tool has a shoulder stop designed to prevent over-expansion of the tube and to form the end of the tube so that it will fit closely into the tube nut.

The reverse curves of the tube nut and ball seat meet on a line running at an angle of 45 degrees to the line of the pipe. When the coupling nut is tightened, the tube becomes slightly compressed at the point of contact, thus forming a wedge on the end of the tube. Note the line of fittings in Fig. 7.

A drop or two of oil is placed in the ends of the tubes. Then the flange tool is driven into the ends of the tube with four or five blows of the 2¼-lb. bronze hammer which is provided for this purpose, as shown in Fig. 8. In this picture the mechanic is shown working on a street connection. The flanging tool is removed

and the compression fitting is screwed together with a monkey wrench, thus enclosing the flanged tube end.

A really clear sectional view of a copper-to-iron coupling after it is put together is shown in Fig. 9. Every joint used with this copper service tube is virtually a union. All iron pipe threads on these fittings are standard. The threads on the tube nuts are as follows:

⅜-inch tube nut ¾-inch x 16 pitch
½-inch tube nut 1 -inch x 14 pitch
¾-inch tube nut 1¼-inch x 14 pitch
1 -inch tube nut 1⅝-inch x 11½ pitch
1¼-inch tube nut 2 1/16-inch x 11½ pitch
1½-inch tube nut 2⅜-inch x 11½ pitch
2 -inch tube nut 2 13/16-inch x 11½ pitch

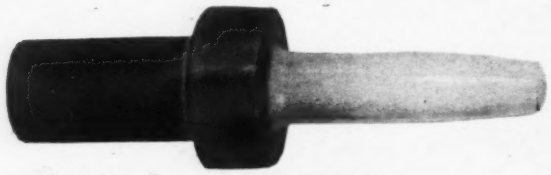


Fig. 6.—Flanging tool

Table of Copper Service Tube in Iron Pipe Sizes

Equivalent iron pipe size, inches	⅜	½	¾	1	1¼	1½	2
Diam. outside, ins.	½	⅝	⅞	1⅛	1⅜	1⅝	2⅛
Diam. inside, ins.	.402	.527	.745	.995	1.245	1.495	1.959
Wall thickness, ins.	.049	.049	.065	.065	.065	.065	.083
Nominal weight, lb. per foot	.262	.343	.640	.838	1.036	1.360	2.062
Test pressure, lb.	1,240	1,140	1,040	780	630	580	520

The size of the pipe indicates the size of the hole the same as in iron pipes. If the contractor wants to extend a ¾-inch iron pipe line, using copper service tube for the extensions, he would ask for ¾-inch copper service tube.

Because copper is ductile and easily bent, swing or extension joints are not used in installations of copper service tube. The tube is let down through the walls of the building in a manner similar to that in which electric wiring is done, and is bent as required.

Fig. 10 is a picture taken in the residence referred to above. The camera was pointed upward in taking this picture. The risers were run directly from the basement as a single tube without threads or fittings. The two

(Continued on Page 87)

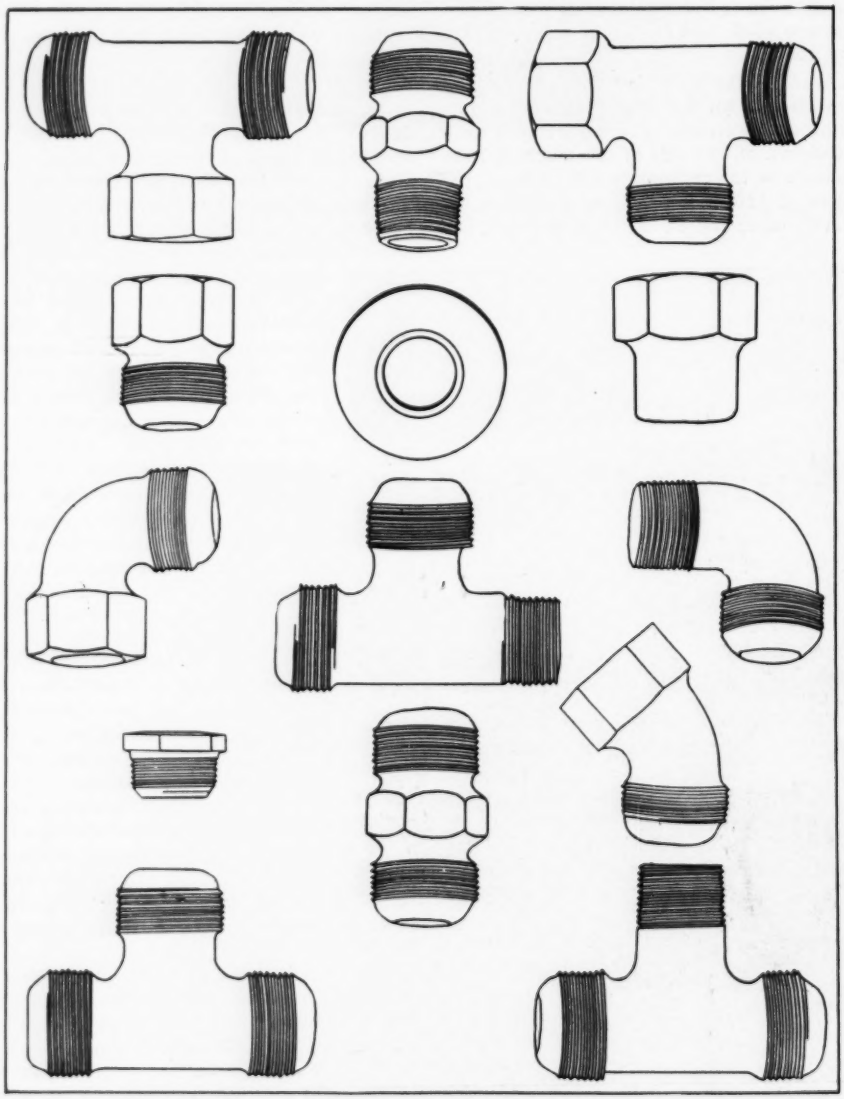
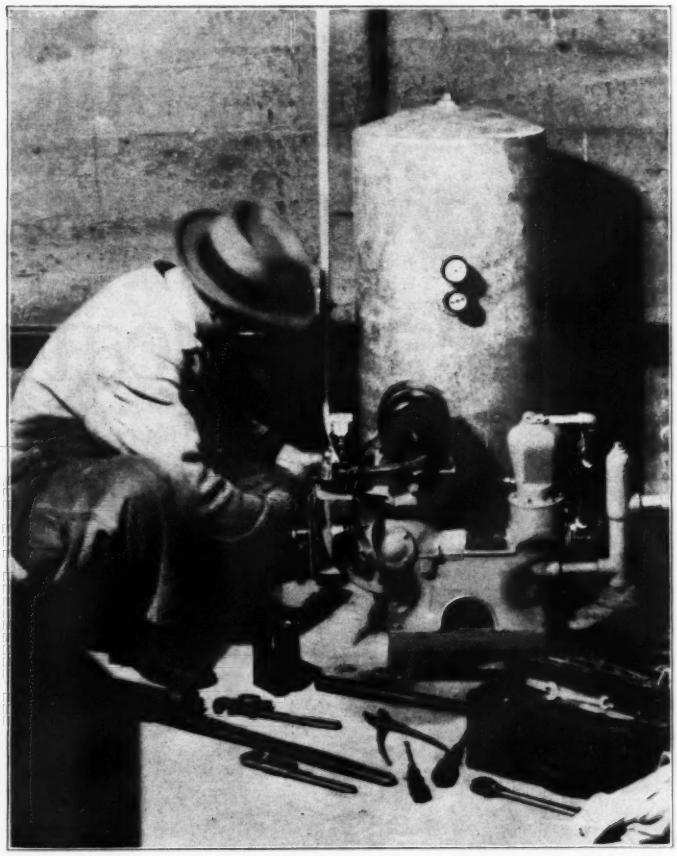


Fig. 7.—A line of compression fittings for copper service tube



The object of this article is to help to eliminate return trips for adjusting water supply systems as illustrated here

Errors Frequently Made When

Installing Domestic Water Systems

By H. H. ENGEL

THE WRITER has been in personal contact with a large number of plumbing organizations for the past eight years and has noticed that certain mistakes are frequently made when installing domestic water systems. It is evident that these errors are made on account of the lack of knowledge of the functioning of various pump parts.

On suction type pumps one of the most common troubles that the plumber experiences is with the suction line. This line may be leaking at the joints or in a great many cases around the packing box of the shut-off valve that is usually placed close to the pump. It requires only a small leak to break the vacuum and to prevent the pump from picking up the water. This, of course, is particularly true on installations where the water is ten to twenty feet lower than the pump. Sand in the suction line coming from the well or source of supply and working up into the cylinder and valves, has also caused a lot of unnecessary trouble, and this can usually be overcome by keeping the suction line several feet from the bottom of the well or by the use of a fine mesh screen. This condition is quite annoying as it does not require a lot of sand under the valves to break the vacuum, which, of course, will not allow the pump to deliver its full capacity. In this case it is necessary to disassemble the water end of the pump and clean out the valves. Pumps should be accessible. They should be so constructed as to permit the work being done in a few minutes.

A great many suction pumps are used to pump rain water from a cistern, in which case the water level is usually higher than the pump. An installation of this kind requires a shut-off valve in the suction line to prevent the water from siphoning into the pump, which will create a water hammer. By closing the valve partly, the water hammer will disappear. This causes the pump to pull the water through the partly closed valve and prevent the siphoning. On cistern installations there is a very small percentage equipped with a valve in the suction line.

In the preceding paragraph where it is stated that the water flows into the pump, it will be noted that a shut-off valve is used. However, if the suction line is long and the vertical distance about the maximum that the pump will

What Dishwasher, other than "Standard" combines these very essential features?

"Standard"
PLUMBING FIXTURES

In five minutes an experienced housewife can find more to like, or to dislike, in any product designed and built for her use than its designer or maker has foreseen in hours of "laboratory analyses." And woman is the "court of last resort" in deciding which of two or more similar products shall survive.

She will determine the future for the electric dishwasher, and to the extent that it incorporates those features which are obviously most conducive to her convenience and efficiency—to the extent that it combines what she *needs*—will she give it her approval, and her patronage.

Her first requirement of this electrical servant is *conscientious thoroughness* in the cleaning of her dishes. Greasy dishes will not be tolerated! Nor will an occasional adhering particle of food on the "clean" dishes escape her vigilance. Therefore, Point Number One must be "A Washing Principle that is Positive and Thorough."

How does "Standard" meet this requirement? (1) By providing a *forceful jet of water,* accurately directed. (2) By utilizing a centrifugal pump because of its *positive action* and constant circulation. (3) By *finely screening the water* before it re-enters the pump. (4) By gently revolving the basket *to expose every part of the dishes* to the forceful jet. (5) By providing *clean* hot water for rinsing *direct from the supply pipe.*

What Electric Dishwasher, other than "Standard", combines these essentials?

So much for cleanliness, or efficiency. But what about convenience? Labor-saving is the main objective of a dishwasher, but will its user *actually* save labor, in the long run? How much cleaning will the dishwasher require? Must the dishes be stacked just one certain laborious way? What added convenience is offered for efficient use of the sink?

Let us see how "Standard" meets these requirements. (1) *Only one small screen* to cleanse of food fragments; easily reached, quickly removed and replaced. (2) Entire dishwashing compartment *free of mechanism*—cleaned by the swish of a dishcloth. (3) Forceful jet and revolving basket eliminates necessity for *one set method* of dish stacking. (4) Individual hot water rinse supply *eliminates hose* and hand-rinsing. (5) Flexible shaft from motor operates revolving brush and a most ingenious, labor-saving whipper for eggs, cream and mayonnaise.

What Electric Dishwasher, other than "Standard", combines these features?

Add to these the manifest superiorities of the "Three 8's" Sink, of which the dishwasher is a unit; of the swinging-spout faucet in improved design; of "Standard" Acid-Resisting Enamel, impervious to stain of fruit and vegetable acids; of tarnish-free Chromard Finish; of the suspended bracket garbage container; of *color,* in the new and distinctive shades provided by "Standard"—add these, and then ask yourself

What Electric Dishwasher, other than "Standard", combines these very essential features?

Obviously, none. Consequently, the "Standard" Electric Dishwasher welcomes the housewife's closest scrutiny. And the plumber who is alert to his opportunities will further the sale of this Dishwasher by (1) becoming thoroughly acquainted with its features through an early visit to the "Standard" Showroom, or better still, by installing and studying one in his own display room, and (2) by imparting his conviction of its superiorities to every likely prospect.

Standard Sanitary Mfg. Co. - Pittsburgh

"Standard" PLUMBING FIXTURES

lift water, which is 22 ft., it is advisable to use a foot valve. This is neglected too many times and usually requires a number of return calls for the plumber and causes dissatisfaction on the part of the customer. If no foot valve is used, it is possible for the pump to lose prime. If this happens it is necessary to pick up the prime, which will require several minutes of unnecessary running.

The writer has noticed a large number of installations where no shut-off valve is used between the pump and tank. When installing a new pump this may not appear to be of any importance; however, we must consider that at some later date it will be necessary to service and make adjustments on the pump. Usually there is a pressure tank used in connection with the water pump, and, if it is necessary to put in new valves or leathers, the tank can be pumped up to the maximum pressure and the valve in the discharge line closed. This will allow a supply of water which will last while the repairs are being made. However, if no valve is used, it will be necessary to drain the tank and cut off the water supply.

There are electric water pumps installed with range boilers rather than with vertical tanks having a water and pressure gauge. Without the water level gauges, the owner may allow the tank to become water-logged, which causes the pump to start and stop when a small amount of water is used. This condition usually develops into several trips for the plumber, which either means that he charges the customer for his time to make the repair, to which the user will usually object, or the plumber makes an adjustment as a matter of policy, and this will naturally reduce the net profit on the installation.

Mistakes on Deep Well Pump Installations

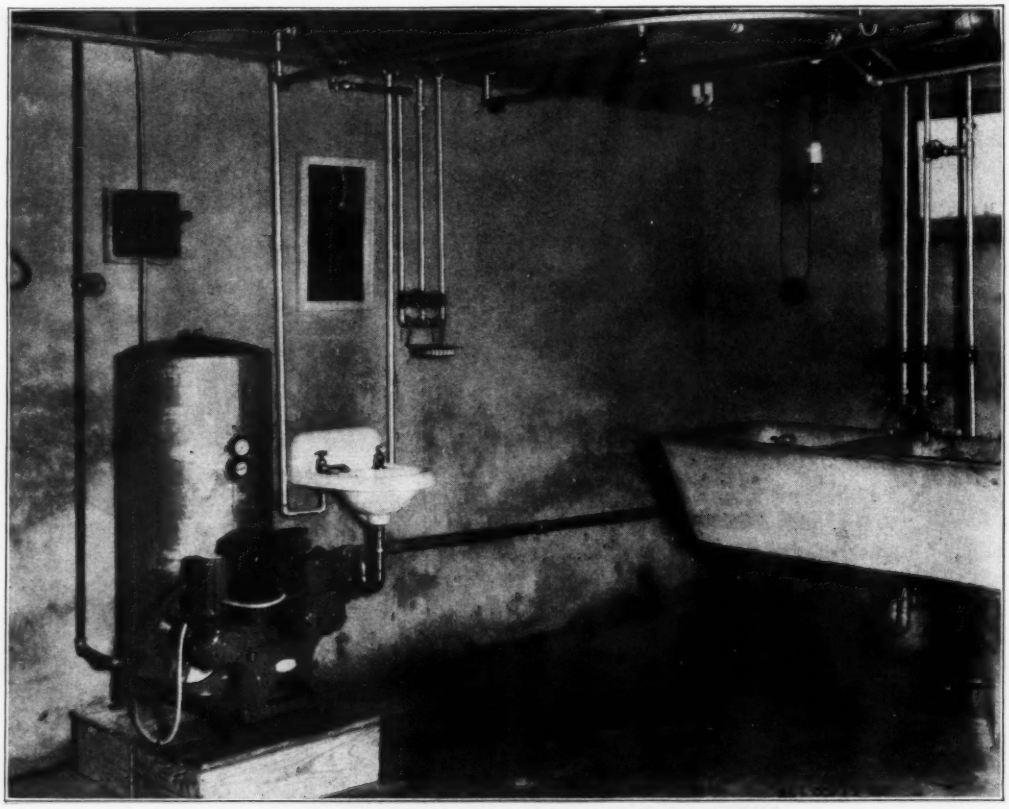
There are a number of mistakes that are made frequently with deep well pump installations. Probably the most common is neglecting to attach the lower valve in the well cylinder. In installations where the lower valve is attached to the plunger valve and allowed to move up and down with the sucker rod, this, of course, will not allow the pump to deliver any water. There is also considerable trouble experienced in cutting the sucker rod to proper length. Instructions for this are usually given in detail by the pump manufacturer. It is necessary to have the plunger move at the central portion of the well cylinder and it must not strike the bottom valve or the top of the cylinder.

After cutting the sucker rod and just before connection is made to the power head, it is advisable to push the sucker rod down until it rests on the lower valve assembly in the well, and with the pump stroke in the extreme lower position it should be required to raise the sucker rod about one inch to connect it to the pump. This will guarantee sufficient clearance.

The wiring of the automatic switch, too many times, is made in a haphazard, careless way. There are certain building codes in most cities prohibiting the use of open wiring, and it is always advisable properly to inclose the wire in flexible loom, preferably of the metal type. This not only makes a nice appearing installation, but provides safety as well.

My object in making these suggestions relative to water pump installations primarily is to increase the plumbers' net profit through the elimination of unnecessary return trips to pump installations. Some of the readers of this article probably have experienced conditions similar to those described above.

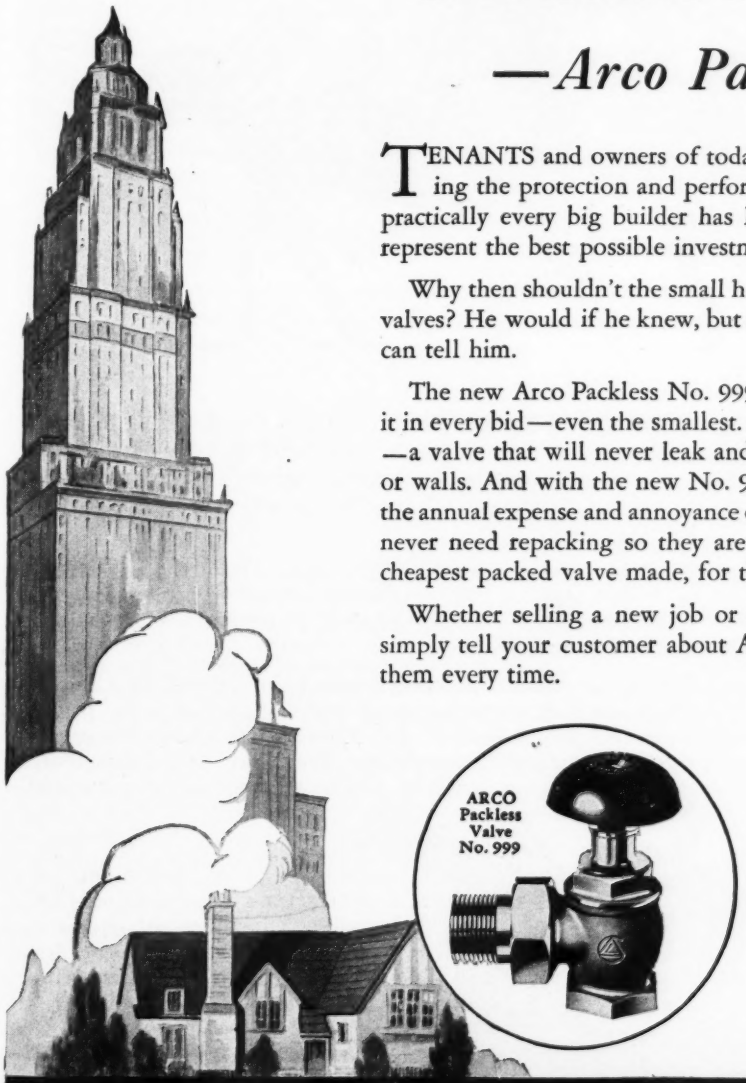
Readers are urged to send in questions to "Domestic Engineering" relative to the installation of automatic water supply systems.



A water supply system as installed in a modern home

The biggest VALVE value for even the smallest home

—*Arco Packless No. 999*



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Time is the essence of a horse race. It is the essence of your business—of every business today. Labor time is the essence of your contract jobs; it determines whether you win or lose money.

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Ohio Brass Valves represent this class of material. They are designed not only for long service after installation, but their design is such that the contractor saves the time of his journeymen on the job. It is well to remember that 5 minutes saved in installing a valve is equal to a 15% reduction in the cost of the valve—and Ohio Brass Valves give you this saving and more.

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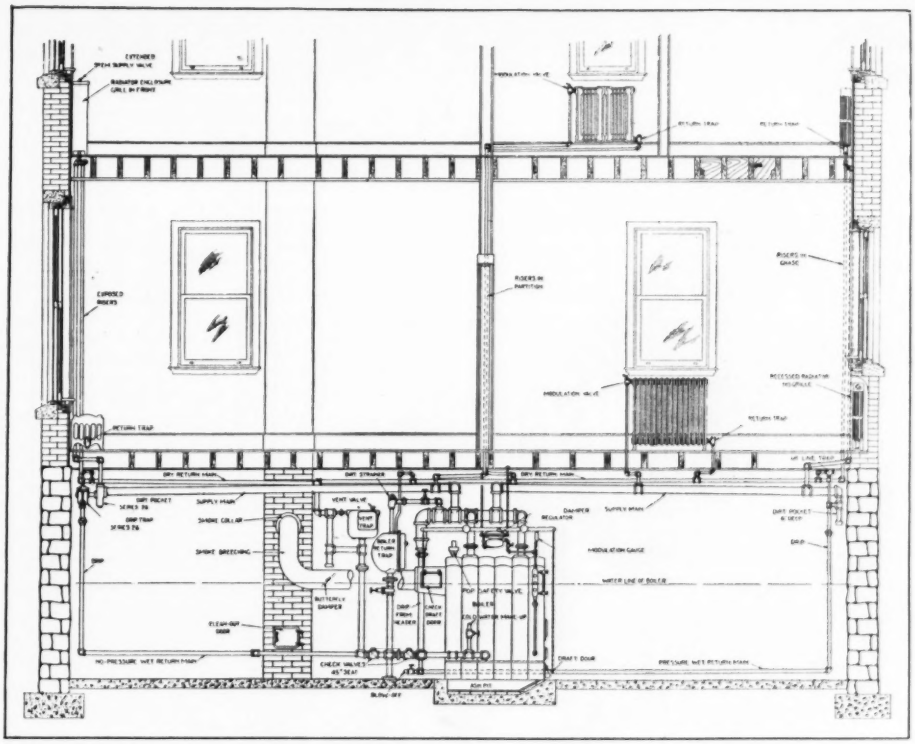

Fig. 1.—Elevation of typical installation of modulation system of steam heating

Vapor Heating Systems

By HAROLD L. ALT

THIS is the fifth of a series of articles on various systems of vapor heating, previous articles having appeared in the issues of September 15, October 6 and 20, and November 3. Another vapor heating system is described and illustrated in this article, the manufacturers of which will not go beyond the conservative statement that "at certain times pressure below that of atmospheric can be obtained."

Nevertheless the system is a true vapor system in every sense of the word and its operation with vapor will continue under conditions in which vapor systems are supposed to operate. A typical installation of this system is pictured in Fig. 1, a close study of which will show several facts of interest.

The Piping System

In the first place the boiler steam uptakes are connected into a boiler header from which two steam mains are taken, one going to each side of the building and pitching downward in the direction of steam flow.

At the end of the supply mains, drips are placed. In Fig. 1 the main shown on the left is dripped through a dirt pocket and a trap. The condensation drops to a no-pressure wet return and this return connects into the heel of the vent trap. The air is vented to the overhead dry return main. The drip, shown on the right side of Fig. 1, is known as a pressure drip. The condensation drops to the pressure wet return and the air rises to an air line trap and the trap discharges into the dry return. The pressure wet return is connected into the discharge from the boiler return trap.

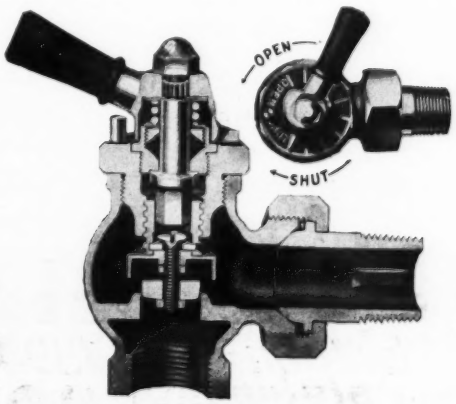

Fig. 2.—Modulation supply valve. Note modulation plug for close control

Connections to risers and radiators are taken from the tops of the mains. Condensation from the radiators connects into the overhead dry return. The dry return comes back to the vent trap where the air is relieved and then drops down passing into the boiler through two check valves. Under low pressure or vacuum conditions the return normally flows directly through these two checks and straight into the boiler. When enough pressure develops in the boiler to shut the check nearest the boiler, the return flows only through the first check and then, finding its entrance to the boiler barred by the second check being

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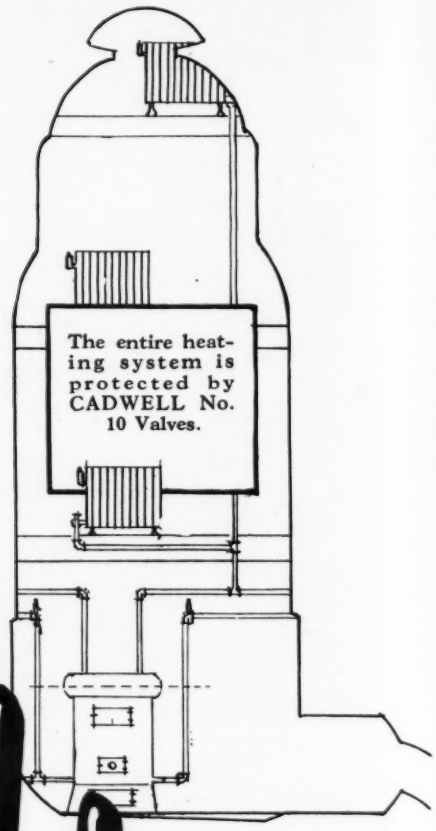

Instantaneous positive action—unexcelled serviceability and quality, backed by an unquestionable reputation plus an absolute five-year guarantee—that is what is offered for your consideration in CADWELL No. 10 Air Valves.

Regular angle type on radiators. Straight shank on main in cellar.

The

BEATON & CADWELL MFG. CO.

Established 1894

NEW BRITAIN, CONN.

held shut by the boiler pressure, the condensation rises up in the pipe connected between the two checks on top of which is set a boiler return trap.

As soon as the boiler return trap is flooded, a float opens a valve so that boiler steam pressure is admitted to the top of the boiler return trap. Thus the pressure is

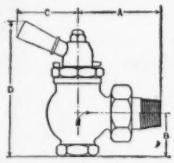

Fig. 3

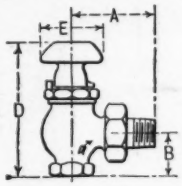

Fig. 4

counterbalanced against the check next to the boiler and the water in the boiler return trap is allowed to sink down by gravity and enter the boiler. It is prevented from entering the return line by the first check which is held shut by the boiler pressure being admitted between the two checks through the boiler return trap.

The Supply Valves

In this system, each radiator is equipped on the supply end with a certain modulation supply valve, this valve being shown in sectional view in Fig. 2, and being equipped with a patented modulation plug designed with such a curvature that steam is admitted and varied in progressive volume in proportion to the lift of the valve piece. As a result of this the proportion of surface heated

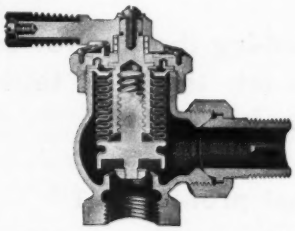
Fig. 5.—Packless quick-opening supply valve

beyond the valve is in accordance with the amount the valve is opened. Each valve is designed so as to have considerable excess capacity when fully opened, so as to

Table 1
Dimensions for Lever Handle Type "W" Valves

Size of Valve	Dimensions A	B	C	D
Inches	Inches	Inches	Inches	Inches
½	2¾	1¼	2⅛	4⅛
¾	2¾	1½	2⅛	4⅝
1	3⅛	1¾	2¼	5½
1¼	3½	2	2¼	6

pass without difficulty enough steam to keep the radiator fully heated on extremely cold days.

These valves are made in both the lever handle and wheel handle type. A dimension diagram for the lever handle valve is shown in Fig. 3 and the dimensions are given in Table 1. A similar dimension diagram for the wheel handle valve is given in Fig. 4, and the dimensions for this diagram are given in Table 2, while the allowable ratings are indicated in Table 3.

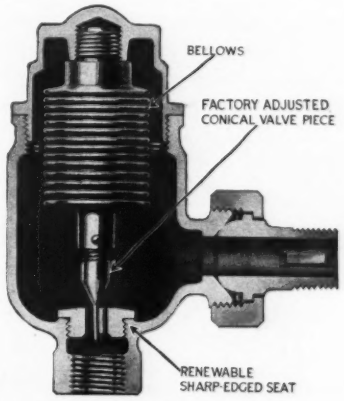

Fig. 8.—The trap

Table 2
Dimensions for Wheel Handle Type "W" Valves

Size of Valve	Dimensions A	B	D	E
Inches	Inches	Inches	Inches	Inches
½	2¾	1¼	4½	2¼
¾	2¾	1½	4⅞	2¼
1	3⅛	1¾	5⅞	3
1¼	3½	2	6⅜	3

Table 3
Ratings of Type "W" Valves

Residences (Small Buildings) Sq. Ft.	Size, Inches	Apts., Schools, Churches (Larger than Residences) Sq. Ft.	Size, Inches
0 to 35	½	0 to 50	½
35 to 80	¾	50 to 110	¾
80 to 130	1	110 to 185	1
130 to 225	1¼	185 to 315	1¼

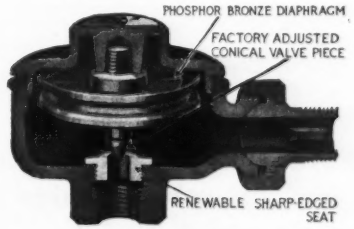

Fig. 9

Cases sometimes arise where modulation is not necessary or may not be desired. In such circumstances the quick-opening, packless valve is often substituted for the type "W" valve, the packless valve having a laminated bellows completely enclosing the valve stem and designed to prevent any possibility of leakage. A cross section of the packless type of valve is shown in Fig. 5.

This packless valve is furnished in both lever handle and wheel handle combinations and a dimension diagram for the lever handle arrangement is shown in Fig. 6,

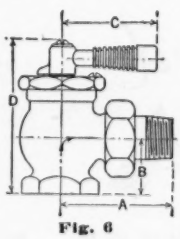

Fig. 6

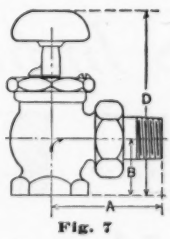

Fig. 7

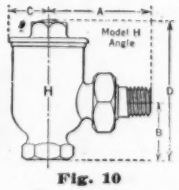

Fig. 10

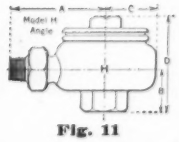

Fig. 11

The Plumbing Primer

"Geor-gie Daw-son is a luck-y lit-tle lad."

"You have said a lap-full, Le-roy. He has got roll-er skates and a bi-cy-cle and a goat."

"His fa-ther must be stink-o with mon-ey, Wil-bur-force."

"Cer-tain-ly he is. He is a pros-per-ous Mas-ter Plumb-er."

"Good-ness me, Wil-bur-force! How did he get so pros-per-ous?"

"By sell-ing the Im-prov-ed Mad-era toi-let, the best toi-let on the mar-ket to-day."

"Is that prof-it-able?"

"I hope to kiss a don-key it is prof-it-able! Four times as prof-it-able as sell-ing a wash-down toi-let."

"No won-der Geor-gie has a bi-cy-cle and a goat."

"No won-der in-deed, Le-roy. Let us fol-low him. May-be he will drop a nick-el."

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while the dimensions are given in Table 4. A similar dimension diagram for the wheel handle packless valve is given in Fig. 1, while the dimensions for this style may be obtained from Table 5 and the ratings from Table 6.

Table 4

Dimensions of Lever Handle Packless Valves

Size of Valve Inches	Dimensions A Inches	B Inches	C Inches	D Inches
½	2⅝	1 7/32	2 5/16	3⅜
¾	2¾	1 11/32	2⅝	3⅞
1	3⅛	1 23/32	2⅞	4¾
1¼	3⅝	1⅞	2⅞	4⅞
1½	3⅞	2 5/32	2⅝	5⅜

Table 5

Dimensions of Wheel Handle Packless Valves

Size of Valve Inches	Dimensions A Inches	B Inches	D Inches
½	2⅝	1 7/32	4 5/16
¾	2¾	1 11/32	4⅞
1	3⅛	1 23/32	6
1¼	3⅝	1⅞	6⅝
1½	3⅞	2 5/32	6⅞
2	4⅝	2⅝	7⅛

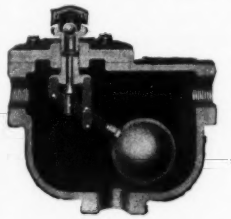
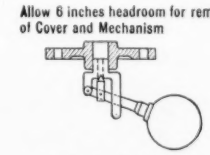


Fig. 12



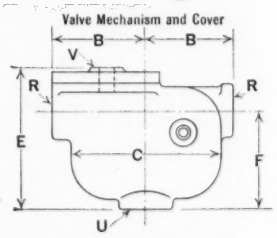


Fig. 13

The Radiator Traps

On the outlet of each radiator a thermostatic trap is used. These traps are of two styles, the one illustrated in Fig. 8, and the "diaphragm" as pictured in Fig. 9. The type shown in Fig. 8 is more expensive than the diaphragm type.

Table 6

Ratings of Packless Valves

Residences (Small Buildings) Sq. Ft.	Size, Inches	Apts., Schools, Churches (Larger than Residences) Sq. Ft.	Size, Inches
0 to 42	½	0 to 60	½
42 to 87	¾	60 to 124	¾
87 to 147	1	124 to 204	1
147 to 252	1¼	204 to 360	1¼
252 to 364	1½	360 to 516	1½

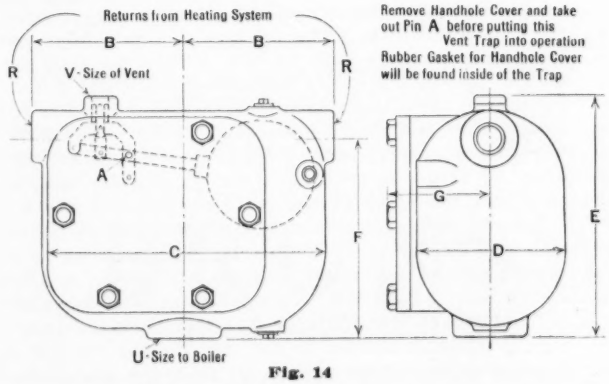


Fig. 14

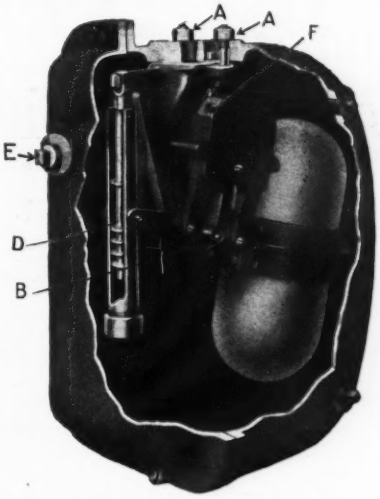


Fig. 15

Table 7

Dimensions of Traps (Fig. 8) Angle Pattern

Size of Trap Inches	No. of Trap	Dimensions A Inches	B Inches	C Inches	D Inches
½	512	3⅛	1⅜	1⅝	4
¾	513	3⅛	1¾	1⅝	4⅛
½	522	3¼	1⅞	1⅜	5¼
¾	523	3¼	2	1⅜	5⅜
¾	533	4	2⅜	1¾	5⅜
1	534	4	2⅜	1¾	5⅜
1	544	4¼	2⅜	2	6⅞
1¼	545	4½	2⅜	2	6⅞

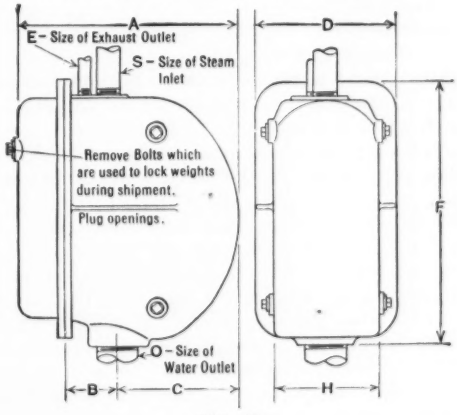


Fig. 16

The trap (Fig. 8) consists of an interior mechanism formed by a bellows with a valve attached to the bottom of the bellows. On the bottom of the valve is an extended pin which acts as a guide and also as means of keeping the opening clear through the valve seat. When steam strikes the bellows it expands sufficiently to push the valve down on the valve seat and thus prevents the passage of steam into the return line. Air and water, being of lower temperature, do not cause the bellows to expand, and their passage into the return line, therefore, is never obstructed.

(Continued on Page 76)

Hydraulics *and* Pneumatics *of* House Plumbing

By R. M. STARBUCK, JR.

IN A PREVIOUS article we have given consideration to several sets of tests recently made at the University of Illinois, by the Engineering Experiment Station, under the direction of Harold E. Babbitt, professor of sanitary engineering.

In this article we are going to continue further along this same line, the information presented being based on the Illinois Bulletin No. 178, just recently published.

ABILITY OF TRAPS TO RESIST BACK PRESSURE

THE next phase of the trap question taken up by the Bulletin is "Comparison of Ability of Traps to Resist Back Pressure."

The report points out that

"The seal of a trap may be broken by back pressure expelling water from the trap either into or through the fixture into the room in which the fixture is located. The water which falls in the fixture, will drop back into the trap, to aid in restoring the seal. Only that water which is blown out of the fixture or retained in it, is lost from the seal of the trap. The intensity of back pressure necessary to break the seal of a trap is dependent primarily therefore, upon the distance between the dip of the trap and the opening into the fixture. It is dependent also, upon the type of the fixture."

Another point brought out, which is self-evident but not generally taken into consideration, is the following:

"It is evident that repetitions of back pressure, none of which remove water from the trap, will not be more effective in breaking a trap seal, than a single application of the same back pressure."

In discussing the comparative ability of traps to resist self-siphonage, some of the facts brought out were as follows:

"Self-siphonage occurs in a trap when water is discharged through the trap from the fixture to which the trap is connected. The combined effect of the inertia of the water passing through the trap, and the partial vacuum created by the falling water in the discharge pipe from the trap, is to leave insufficient water to fill the trap seal, or it may even leave the trap seal broken after the completion of a discharge.

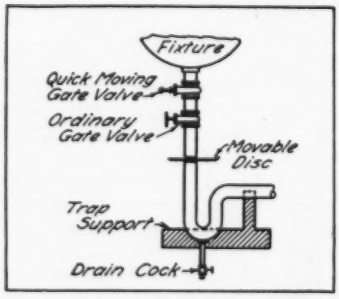


Fig. 2

"An important factor in the design of most fixtures and traps, which counteracts the effects of self-siphonage upon traps, is the construction of the fixture or waste pipe so as to retain an appreciable quantity of water, after the fixture discharge is completed, to drip into the trap and restore its seal."—The facts which govern self-siphonage were reported in an earlier Illinois bulletin:

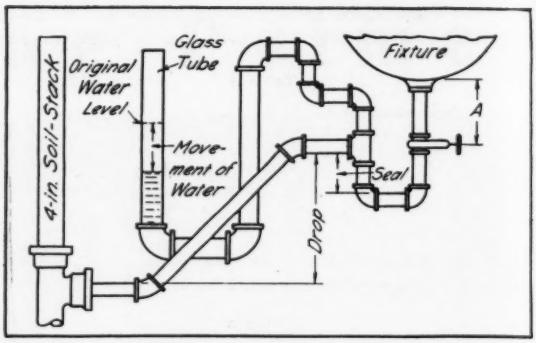


Fig. 1

"These factors can be summarized as follows:

"(1) The resistance of a trap to self-siphonage is increased by impeding the flow of water through the trap.

"(2) The resistance of a trap to self-siphonage varies with the depth of seal of the trap.

"(3) The intensity of vacuum produced in a trap when water is discharging through it, varies with the rate of discharge.

"(4) The intensity of vacuum produced in a trap when water is discharging through it, varies with the drop on the waste or discharge pipe.

"(5) The intensity of vacuum produced in a trap by self-siphonage is independent of the length of vertical pipe between the trap and the fixture, provided the rate of discharge remains unchanged.

"(6) The destruction or weakening of the seal of the trap by self-siphonage can be prevented by venting, or by the design of the fixture."

THE TEST APPARATUS

THE TEST apparatus used in arriving at the above results is shown in Fig. 1, but it did not prove satisfactory, owing to the fact that in its use enough water dripped back from the fixture and valve and walls of the waste pipe to re-seal the trap after it had been discharged.

The apparatus shown in Fig. 2 was finally devised, and tests made with it were practically free from the condition mentioned.

Using this apparatus, the trap test was made in the following manner:

"The quick-moving gate valve was closed. The ordinary gate valve was set to deliver water at a predetermined rate. The fixture, which consisted of a conical galvanized iron tub, was filled with water to a level which, in conjunction with the opening of the gate valve, determined the rate of discharge. The quick-moving gate valve was then opened with a swift motion. When the trap was seen to be running full, a flat disc or plate was quickly inserted in the opening shown in the waste pipe, at the same time that the quick-moving valve was closed. The disc was held close to the end of the upper pipe. Thus all drip was prevented from passing through the trap, and the effect of siphonage on the trap was not interfered with. The amount of water remaining in the trap was then measured. This was seldom found to be exactly enough to seal the trap; it was either too much or too little. Each test was repeated at least five times without change of conditions. The average of the quantities of water remaining in the trap for any number of repetitions at the same rate of discharge was plotted

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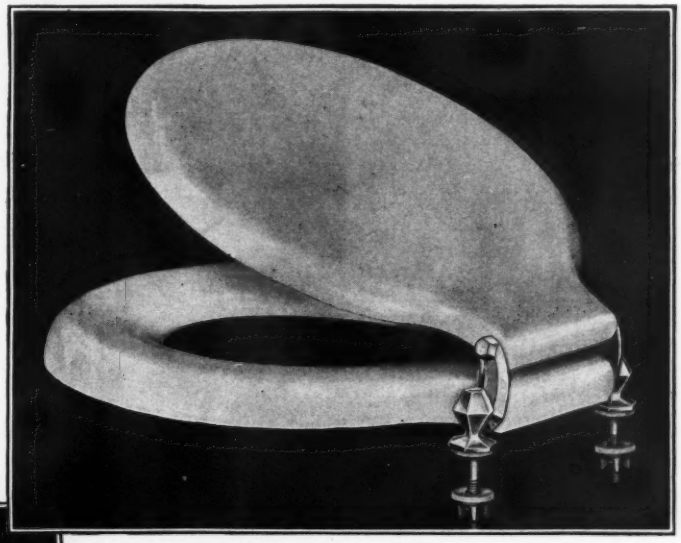
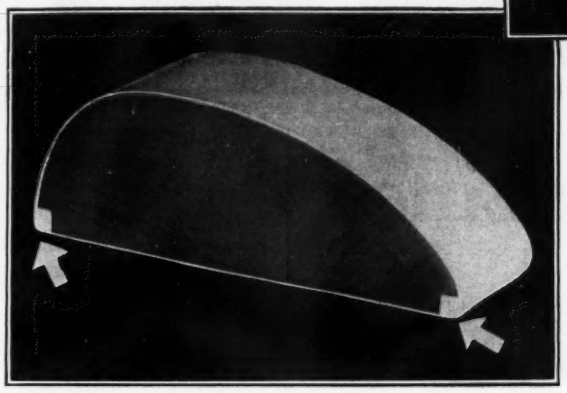


Brunswick White Seat, Model 300, with chromium plated hexagon hinge



THE makers of the famous Whale-bone-ite Seat now offer their newest triumph in seat manufacture. The Brunswick White Seat shown here is a pyralin sheet-covered seat on wood base with a unique patented feature that means complete protection at the outer edge of the seat where danger of damage is greatest.

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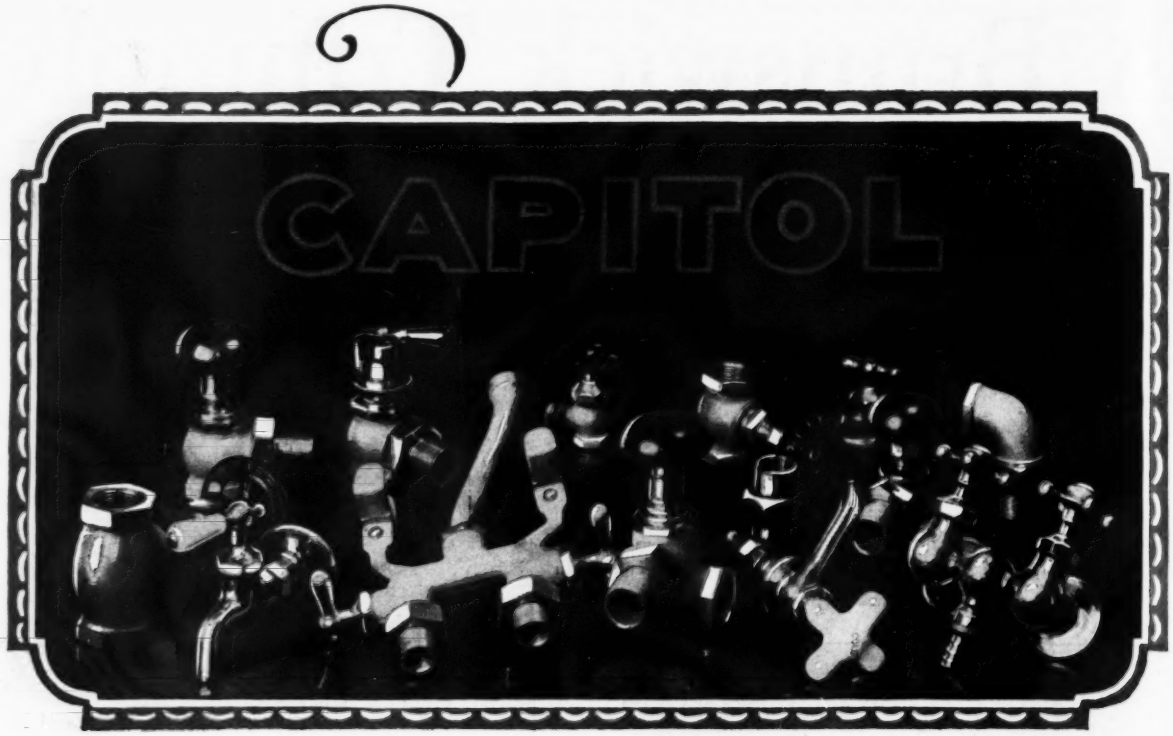

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against the rate of discharge thus locating a point on a diagram. Other rates of discharge were tried and points located in the same way."

In each test various waste pipe arrangements were used. We will not show the plotted diagrams of the tests, but will show Table A, which will clearly show the comparative results obtained from testing various traps for self-siphonage.

Table A covers the common types of plain traps, and

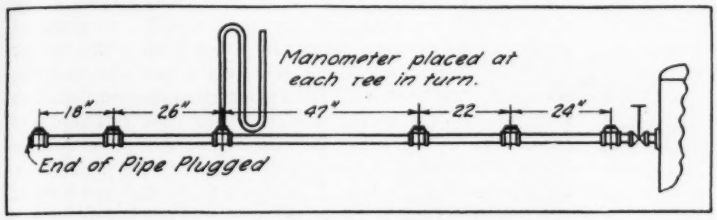

Fig. 3

another table covered non-siphon traps and drum traps.

The conclusions reached from these tests are that:

"(1) The relative order of strength of seal to resist self-siphonage in standard lead traps is viz.: Running trap, bag trap, P trap and S trap, the running trap having the strongest seal.

"(2) An increase in the length of either the vertical or the horizontal portion of the waste pipe, up to a certain limit, causes less water to be left in a trap after the discharge of the fixture to which it is attached. This renders easier the breaking of the trap seal by air pressure.

"(3) The point at which an increase in the length of the waste pipe will not cause a decrease in the water left in the trap after the discharge of a fixture is reached when the friction becomes great enough to reduce the maximum flow which can pass through the trap. This condition is illustrated in runs 59 and 60 shown in Table A.

"(4) It is possible to select a size and type of trap which cannot lose its seal from self-siphonage, if the rate of discharge from the fixture and the arrangement of the waste pipes are within the limits of those used in obtaining the results recorded in Table A. For example, let it be desired to install a wash tray with a vertical drop of 30 in. in the waste pipe from the trap to the main waste. The rate of discharge from a wash tray is assumed to be equal to three fixture units, or 22.5 gallons per minute. From Table A it is seen that a greater rate of discharge than 22.5 gallons per minute is required to siphon any 2-in. trap with 30 in. of vertical waste pipe. If the fixture were a kitchen sink, with a discharge rate of 11.3 gallons per minute, and the same length of vertical waste pipe, a 1¼-in. bag trap could be installed without danger of self-siphonage occurring.

"(5) The seal of none of the non-siphon traps tested, including the drum traps, could be broken by self-siphonage under conditions of maximum rate of flow through the trap."

It should be noted that in the tests from which the above conclusions were drawn, no account was made of the drip falling back into the trap after the discharging of the fixture had come to an end. It will be recognized that this drip would be still further insurance against the breaking of the seal.

Table A, which is typical of the results obtained from the self-siphonage tests, is given on next page.

SAFE DISTANCE BETWEEN VENT AND TRAP

ANOTHER line of investigation taken up by the Illinois report concerns "Transmission of Siphonage in Waste Pipes and Distance Between a Trap and Its Vent."

Anyone who has studied the subject of venting, will recognize that much valuable information should come from an investigation into this phase of the subject.

The report goes on as follows:

"If it is found that the effect of a long waste pipe on the transmission of siphonage from a stack, or other waste pipe, to a trap, is to reduce the intensity of the siphonage, it is possible that traps placed at the upper end of a long waste pipe may be provided with smaller vent pipes, or may even not require venting."

It is concluded on page 45 of Bulletin No. 143, that: ". . . the (back) pressure in all traps on the same waste pipe is the same" (regardless of distances up to 25 feet from the stack). It would seem that the same condition should hold true for the transmission of siphonage as for back pressure. Tests were made, however, to determine the accuracy of such an assumption.

The apparatus used in making these tests is shown in Fig. 3. In describing the tests, the report gives the following:

"When testing the intensity of vacuum in the waste pipe at different distances from the vacuum tank, no trap was used, and the end of the waste pipe was closed. Measurements of intensity of vacuum at various distances from the vacuum tank were then made, under similar conditions, by means of the manometer shown in the figure. The results of observations showed the same intensity of vacuum existed at all points in the waste pipe.

"When testing the effect of placing the vent at different distances from the trap, the trap was placed on the end of the waste pipe furthest from the vacuum tank. The vent was moved successively to different positions, and the vacuum or negative pressure required to siphon the trap was observed. The results are plotted in Fig. 4.

"It is evident from the results shown in the figure that,

(Continued on Page 85)

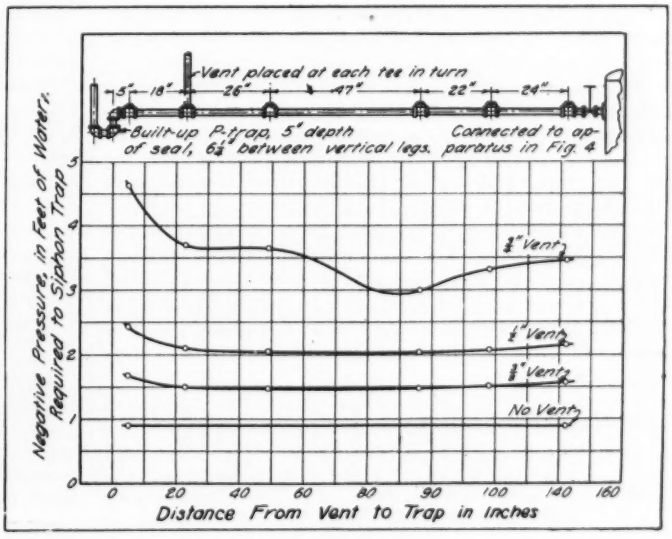

Fig. 4

Modern Solders *and* Their Application

By WILLIAM MASON, Liverpool, England

WITHIN the past few years numerous developments have been made in Europe with solders of special compositions.

The views of several recognized authorities and makers of these solders are included herewith, and no details are included which have not been carried out in practice.

Extensive trials have been made with solders of low tin content, and for the most part 25 per cent was found to be ample. Speaking tubes joined with this preparation proved quite satisfactory. For work of less high-class character even 10 per cent of tin sufficed, and both these grades have been largely employed. Solders low in tin have also been used for other purposes, such as long joints of sheet zinc cases, the 25 per cent grade having superseded the former 40 per cent solder. For soldering the armatures and other important parts of dynamos, however, a larger percentage of tin had to be employed, because the more powerful fluxing liquor required for the lower grade solders, to get them to run properly, corroded the insulation. A 50 per cent solder had to be maintained in the case of compressed-air chambers, in order to obtain sufficient elasticity to enable the joints to follow the changes of shape produced in the material under alterations in pressure.

It was proposed to use a lead solder containing 10 per cent cadmium and a similar amount of tin, but the first trials showed it to be unable to withstand heavy stresses; nor was the production of cadmium large enough to furnish the requisite amount of solder. Better results were obtained using a solder with 15 per cent of cadmium, this being equal to one with 20 per cent of tin, except in the case of galvanized iron. Subsequently the so-called Goldschmidt solder—12 per cent cadmium, 2 per cent tin—melting at 220 to 240 degrees C., was used for soldering zinc articles and electrical apparatus (connections for coils, cables, switchboards, collector segments, etc.) as also for the caps of fuses. It was found unsuitable for stout brass cases, however, being unable to stand the impact test. In general this cadmium solder was found to flow better than many solders, and to be more suitable for fuse caps. It was also used for speaking tubes, slight leakages being in this case comparatively immaterial.

Experiments demonstrated that iron, lead, lead-coated sheet iron and tinplate (but not copper or zinc) could be successfully joined with a lead solder containing 10-13 per cent of antimony which was also good enough for speaking tubes and whistle tubes. For galvanized iron the zinc had to be removed with hydrochloric acid and the seat of the joint coated with a preliminary layer of the antimony solder. Less favorable results were obtained at a shipyard which reported that the joints on galvanized iron gave way (probably through imperfect removal of the zinc in the first place). The high melting point of this solder renders it less suitable for jointing lead than for iron and tinplate.

A special solder for zinc and galvanized iron was introduced, and proved very useful for various purposes. As a test, tubes of galvanized iron about 50 mm. diameter and 1½ mm. thickness were joined by telescoping, the joint being cleaned with a special non-acid fluxing liquor and soldered together with the iron. The joints remained intact even when the tubes were beaten out flat with a wooden mallet. Galvanized sheet iron and sheet zinc, copper and brass, without any cleaning save brushing with the fluxing liquor, were lapped and soldered with this alloy, and the joints could be bent at right angles in the vise without cracking, and the same result was obtained with right-angle butt joints on sheet iron. This solder consisted of mercury 4 per cent, tin 3 per cent and the rest lead. The maker also proposed two other solders, one with 6 per cent mercury, and 3 per cent tin, and the other with 8 per cent mercury and 6 per cent tin, for joints subjected to heavy compression stresses and vibrations aboard ship. The 3 per cent tin solder proved not quite so good as a 30 to 40 per cent tin alloy of the Goldschmidt solder already mentioned, but nevertheless was used exclusively for large tanks for the distilled water for charging accumulators. The 6 per cent tin (and mercury) solder flowed rather better, and proved particularly suitable for soldering lead pipes. Compressed air pipes jointed with this alloy stood pressures up to 170 atmospheres, which indicated its capacity as a substitute for 40 per cent tin solder. The danger of mercury fumes is nonexistent, the solder melting at 180 to 260 degrees C., whereas mercury does not volatilize below 360 degrees C., and no injury was caused to solderers who worked with the alloy for six months at a stretch.

Of later years this solder has been largely used for ship fittings, and experience in the shipyards showed that the parts to be joined required to be made fairly hot in order to obtain good results. Both the 3 per cent and 6 per cent tin solders containing mercury proved satisfactory, in respect of flow and strength, for coppersmiths' and tinsmiths' work.

A curious phenomenon was observed in one instance when these solders were used for soldering the tubes of radiators by dipping, the outer rows of tubes cracking in places. This was attributed to the iron hoops being too strong to allow the tubes to expand freely at the high temperature of the operations; but this explanation does not seem to harmonize quite with the fact that the tubes remained intact when treated with another special solder which had a still higher melting point, and the probability is that the mercury acted on the thin brass of the tubes. This special solder was first employed for making joints in tanks and condensers by the dipping process. The results at first were disappointing, because the fluxing liquor evaporated before the solder could begin to run, and the joint surfaces were not sufficiently cleansed. Eventually an improved fluxing solution afforded the remedy. The composition of the solder was also modified by the inclusion of tin (15 per cent) and this product was reported on, as specially suitable for soldering with the lamp or gas flame (flanges, etc.), though less so for use with soldering iron, whilst some operators classed it with ordinary lead solder with reference to resistance to stripping.

Foreign trade-marks are entitled to protection under the new trade-mark law in Austria, which went into effect last June, only in case reciprocal protection is given to Austrian marks in the respective foreign country. Applications for registration in Austria of a foreign mark must be accompanied by proof that such mark is registered in the country of origin. Such application is to be filed with the chamber of trade, commerce and industry at Vienna.

Risky Business

If you haven't a copy of the Square "Gee" Costalog on file, request it today.

HOW much would it cost you to back out a line to get at a leaky fitting? Ten, fifteen, maybe twenty dollars. All that needless cost just because of a "no-account" fitting. Can you afford this risky business of taking a chance with any old kind of fittings?

Remember — pipe fittings are the vital connecting links in plumbing and heating installations. Upon their performance depends the performance of the entire job. It's a wise plumbing contractor who buys dependable pipe fittings — fittings that "come easy and fit tight" — that save time — cut costs and safeguard the installation — Square "Gees."

So confident are we of Square "Gee" performance that we say: "Your fitting problem is solved when you say Square "Gees."

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RETAIL ADVERTISING SERVICE

$4.20 for twelve weeks' service. We send new cut each week. You take copy from this page.

It may be true that a man who builds a better mouse-trap will have a path beaten to his door. If so, then mouse-traps are the exception which proves the rule that it pays to advertise. Certainly in the matter of plumbing and heating goods the world doesn't rush to us to buy—though we have beautiful and essential products. The retailer in our industry must advertise—to make his newspaper advertising easy we'll send a new cut each week for twelve weeks for only $4.20.

Series No. 41

Use waste space for an extra bath

FREQUENTLY a hall clothes closet is only a convenience—for rubbish. We fill it with things which might as well be thrown away, or kept elsewhere. That closet space, made into an extra bathroom, would furnish far more in convenience and comfort to the family than it does as a "coat closet," which is usually a catch-all. Telephone, and let us show you how to make use of it, adding value to the house out of proportion to the investment.

(In this space your Name, Telephone Number and Address)

READING notices like the one below will not only keep your name before the community—they will secure business. Use this one.

EXTRA CLOTHES CLOSET OR EXTRA BATH?

"We all hate to throw things away," says Harry Brown, local plumbing and heating contractor. "So we always insist on plenty of clothes closet space in houses we buy or rent. Then we can store all the old things for which we feel a sentiment.

"It would be more to the point to clear out the rubbish which accumulates in extra clothes closets and turn them into extra bathrooms. Then the 'strain on the family tie' during the busy morning and evening would be eliminated, the old house would have a lot more self-respect, and compete successfully with newer houses."

Space for an Extra Bath

EVERY house has waste space in it. Upon the use of that space, in these days of stiff competition in the real estate field, may depend the sale or rental value of the older type of home. Let us show you how to fit an extra bathroom into your house. It will add a value far in excess of the moderate investment required—to say nothing of the wonderful comfort and convenience of a second bath in the house.

(In this space your Name, Telephone Number and Address)

HERE is a sales letter on the extra bath idea. Keep it on file to be used from time to time.

HARRY BROWN
PLUMBING & HEATING

Two Rivers, N. Y.,
November 24, 1928.

Mrs. Edward Jones,
Two Rivers, N. Y.
Dear Madam:

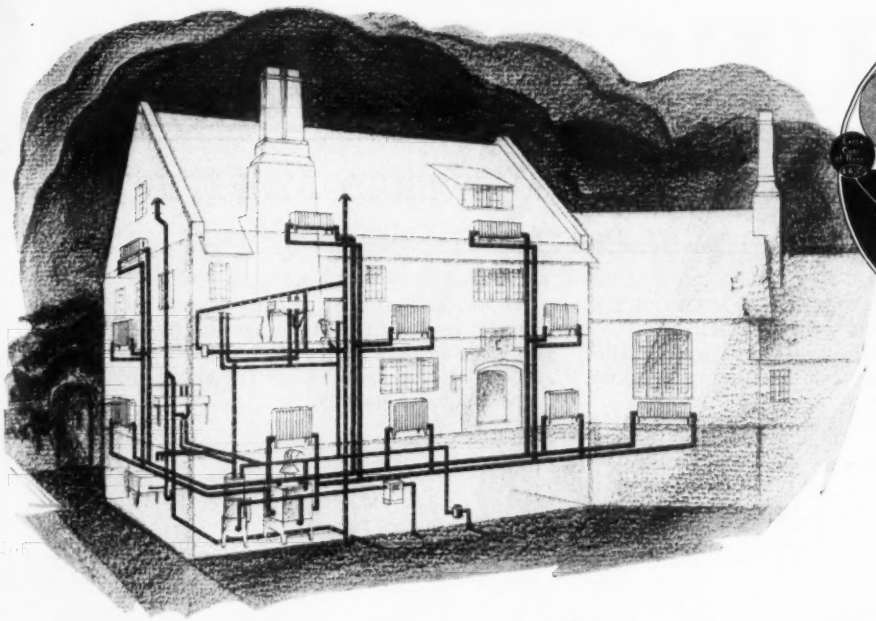
There is waste space in every home. Older types of homes were built that way. And sometimes we fail to recognize an opportunity to modernize the home and to bring its value up alongside that of more modern buildings.

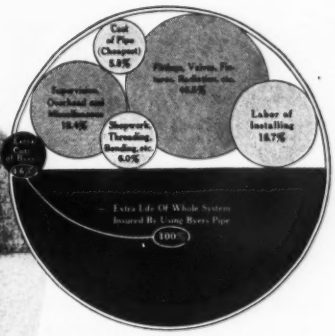
Most of us think we need extra closet space. But when we have it we clog it up with things which might just as well be thrown away or permanently stored. Human beings have a way of hanging on to things for sentimental reasons.

Rather than extra clothes closet space, it would be much more convenient to the family, and add much in value to the house, if such space were given over to an extra bathroom. Note how modern houses when they are advertised for sale or for rent are always presented as having "two baths." It's the modern idea.

The extra bath can be added to your home for a moderate expenditure, and the value added will be far in excess of the cost. Just telephone.

Yours truly,
HARRY BROWN.




Cost of Pipe (Cheapest) 5.8%
Fittings, Valves, Fixtures, Radiation, etc. 40.8%
Supervision, Overhead and Miscellaneous 18.4%
Labor of Installing 18.7%
Shopwork, Threading, Bending, etc. 6.6%
Extra Life Of Whole System Insured By Using Byers Pipe
100

The Extra Cost of Byers

The diagram shows graphically the relation between the cost of pipe and the other items in an average pipe system. Note the very small proportion of pipe cost to the total cost of the pipe system. Yet above all other materials that enter into the construction or equipment of homes, large buildings, and factories, the pipe bears a burden of responsibility that can not be shifted. Failure of the pipe carries with it failure and ruin of much more costly materials, and entails a staggering replacement cost.

When Selling a Plumbing System
.... *sell satisfaction at a profit!*

IT is easier to sell a good and lasting piping system than it is to sell an ordinary one, because the better pipe material will result in more permanent satisfaction, add to your own reputation as a plumbing contractor and allow you a considerably greater profit.

You know the durability, the rust-resisting qualities and the ease of cutting and threading genuine wrought iron pipe. You know that wrought iron pipe will give at least twice the length of service of ordinary pipe—investigations have proved it. You know also that the use of Byers Pipe adds only a very small percentage *to the cost of the entire piping system installed.* And you know that your profit margin will be considerably greater.

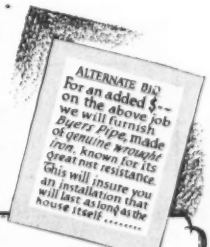
The specification of Byers Pipe, therefore, obtains a ready welcome. The lasting qualities of Byers Pipe add immeasurably to the life of the system and avoid those frequent, annoying and costly replacements that cheaper pipe is known to cause.

The simplest way to recommend Byers Pipe is to include it as an alternate bid. For this purpose, a supply of alternate bid labels will be furnished you on the return of the coupon below. You simply paste one on each piping bid, indicating the small extra cost if Byers Pipe is used. Try it on your very next bid. You'll be glad you did.

• • • • •

A. M. BYERS COMPANY
Established 1864 Pittsburgh, Pa.

the *Spiral Stripe* protects you against mistakes and substitution


ALTERNATE BID
For an added $... on the above job we will furnish Byers Pipe, made of genuine wrought iron, known for its great rust resistance. This will insure you an installation that will last as long as the house itself.....

BYERS PIPE
GENUINE WROUGHT IRON

A. M. BYERS CO.,
Dept. D-11, Pittsburgh, Pa.

Without cost to me, please send me..... Byers Alternate Bid Labels for use on all piping estimates. Also your free book, "The Installation Cost of Pipe."

I am a.....
(plumber or heating contractor)

Name.....

Address.....

QUESTIONS

ASKED BY READERS AND ANSWERED BY EXPERTS

HOW TO MAKE A STEAM HEATING PLANT WITH TOO LARGE A BOILER WORK RIGHT

Editor, "Domestic Engineering":—We have been called upon to cure a low pressure steam heating plant, which, the owner says, is sick.

A rough sketch of the plant is shown in Figs. 1 and 2.

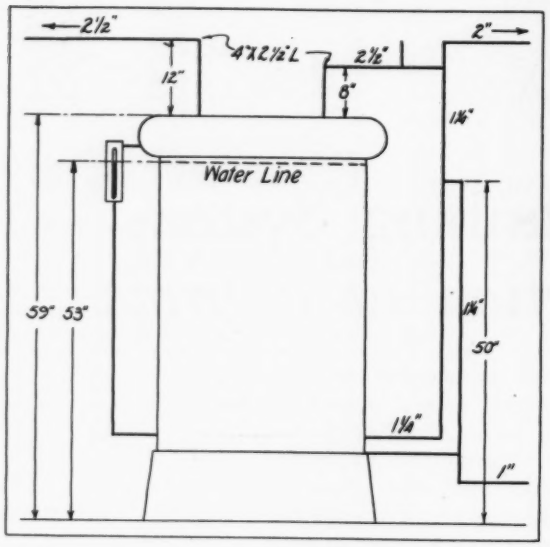


Fig. 1

The trouble is this, that the water leaves the boiler before there is any pressure.

The boiler is larger than what is required to supply the present plant, but it was installed to take care of additional radiation which will be added later on.

The cellar is only 6 ft. 3 inches high, and it would be a very expensive matter to lower the boiler.

How can I make this plant work right?

Maryland. C. T. J.

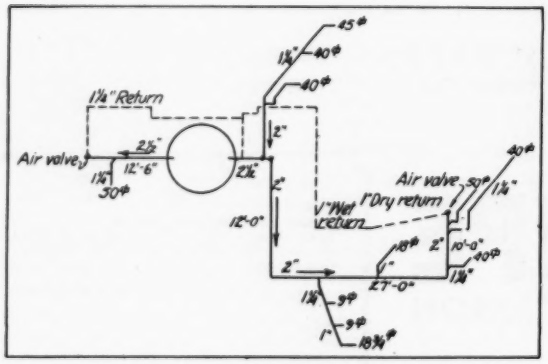


Fig. 2

We would check the steaming capacity of the boiler by building up a wall of fire brick on one or more of the grate bars so as to reduce the coal capacity of the fire pot and at the same time reduce the ability of the boiler to make steam too quickly.

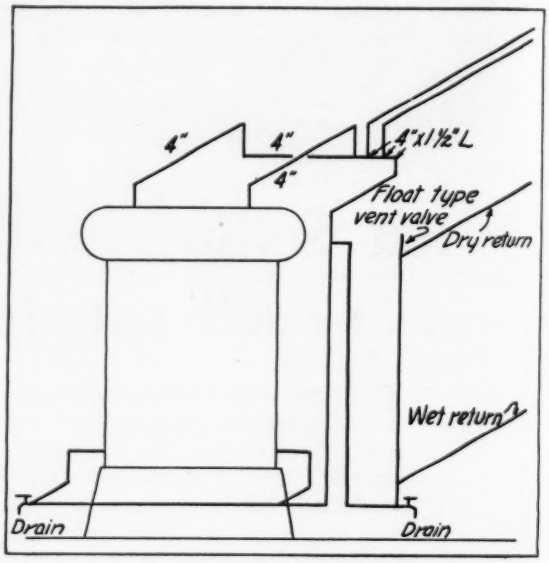


Fig. 3

Also, under the conditions of the installation, we would change the piping, joining the two outlets from the boiler into a drop header, taking off the branches to the mains between the last tee and the reducing elbow connecting the header to the equalizer pipe.

We would also bring back the returns into a Hartford return connection and we would unite the two returns.

From past experience we have every reason to think that these changes will result in the retention of the water in the boiler.

We would install a float type vent valve (see Fig. 3) on the return line and would make the installation without the use of check valves.

The Newer Chemistry of Coal

Modern fuel technology was pictured as the key to "an ever increasing activity and probably an expanding prosperity" in the bituminous coal districts of the United States by President Thomas S. Baker of the Carnegie Institute of Technology in his address of welcome to the 2,500 delegates at the Second International Conference on Bituminous Coal a few days ago.

Dr. Baker, who organized the conference, foresees the day when the mine mouth, as a result of the "newer chemistry of coal," will be the focal point of innumerable new industries made possible by the pre-treatment of coal.

Milvaco Syphon Air Valve to complete the line

NOW—the Milwaukee Valve Co. introduces the new Milvaco Syphon Air Valve—the result of unlimited experiment and laboratory research—an air valve that overcomes the weaknesses common to Automatic Air Valves.

In line with other Milvaco Products this new valve is constructed of the highest grade materials — rigidly tested and inspected—highly plated and polished—and sold at a price that will beat competition and still show the trade a good profit.

Send For Special Introductory Offer

MILWAUKEE VALVE COMPANY
139-201 Burrell Street, Milwaukee, Wisconsin
Please send me complete information and special introductory sales and profit offer for the new Milvaco Syphon Air Valve.

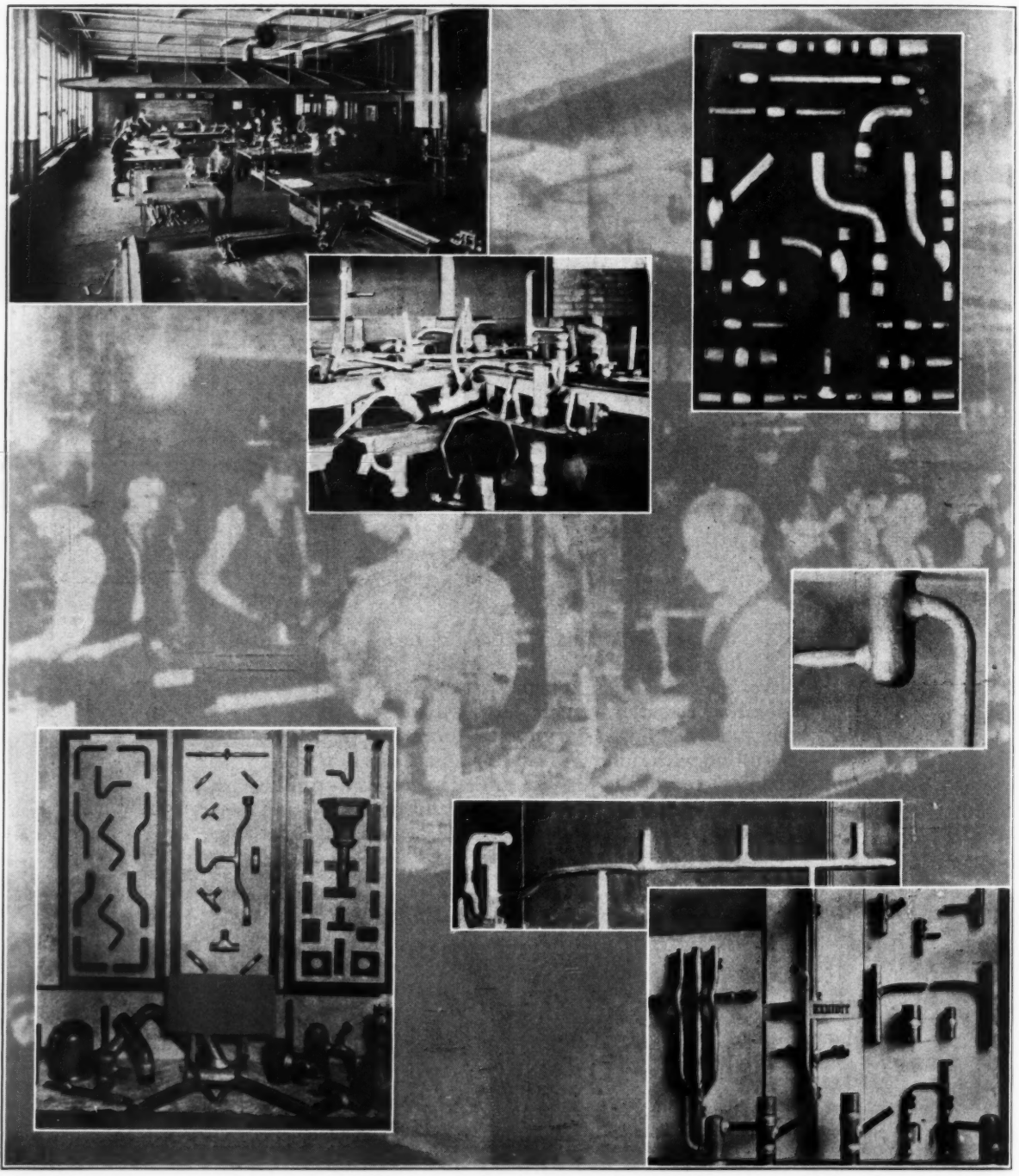
Name.....
Address.....
Dept. M

MILWAUKEE VALVE CO.

MILWAUKEE, WISCONSIN

LEAD — ITS STORY AND ITS USES

No. 23 in a Series of Picture Stories Describing Lead and its Uses in Plumbing and Sanitation



LEAD WORK IN SCHOOLS: **Upper left picture is a scene in the lead working class of the Connecticut State Trade School at Bridgeport, Conn. Just below it is an exhibit of lead work done by students of the Boys' Vocational School of Atlantic City, N. J. Daniel Duffy is plumbing instructor of this school. The lower left picture is an exhibit of the lead work done by the plumbing class of the David Ranken, Jr., School of Mechanical Trades, St. Louis, Mo. Upper right picture was received from George Wm. Farndale, plumbing instructor of the Milwaukee Vocational School, Milwaukee, Wis. Another lead exhibit is shown in the lower right hand picture. This work was done by the plumbing students of the Roman Baldorioty de Castro Technical School, San Juan, Porto Rico. Harry E. Jarrett is plumbing instructor. The two smaller pictures above the one just referred to, also are samples of lead work done by the plumbing students of this school.**

Codes and Ethics for Plumbing and Heating Contractors

By Prof. Samuel E. Dibble*

A PROCEDURE of practice, written in the form of a code, is as essential for the conduct of business as it is for the conduct of personal affairs. A program of procedure seems to be a requisite to guide and govern every activity of individuals as well as of industries. Codes are necessary to keep the unscrupulous individuals and industries within reasonable confines of practice; to curb the desires of dishonest, ignorant and ill-informed ones, and to guide them toward the right and correct procedure. Codes are necessary to guide honest individuals and business organizations toward uniform practice, and to provide, for their information and understanding, the minimum requirements of the industry. The plumbing and heating industry is typical of all other industries. In the past it has shown its need for a code, and it now should see that the code is maintained and enforced. Codes should not and do not state how fine an installation shall be; there is no fixed maximum. There is a limit of the minimum requirement—the least allowable practice. Workmanship is not sufficiently covered; greater skill in workmanship should be insisted upon.

In addition to a code of practice, there should be a code of ethics, which every contracting organization should sign and uphold. Substantially, that code can be written from the Code of Ethics for Engineers.

1. The contractor will carry on his work in a spirit of fairness to employes, and of fidelity to clients and employers, loyalty to his country and devotion to high ideals of courtesy and personal honor.
2. He will refrain from associating himself with or allowing the use of his name by an enterprise of questionable character.
3. He will advertise only in a dignified manner, being careful to avoid misleading statements.
4. He will not use unfair means to win advancement or to injure the chances of another contractor to secure and hold work.
5. He will co-operate in upbuilding the profession by exchanging general information and experience with his fellows, and also by contributing to work of research, schools of applied science and the technical press.
6. He will interest himself in public welfare, in behalf of which he will be ready to apply his special knowledge, skill and training for the use and benefit of mankind.

These six statements are part of the engineer's code, and should likewise be a part of the contractor's code. As plumbing and heating contractors, there must be a strong effort not to consider a firm in the same business as a competitor. If the contractor expects to make a decent living plus profit, he must treat those in the same kind of business as co-operatives and should expect to be so treated by them. His competitor is in some other line of business, such as the automobile and the radio. A code of ethics and a code of practice lived up to places the industry on a plane to be respected by all. A code which is an objective, under which many operate and seek to fulfill its requirements, will do much to make more co-operation and fewer competitors.

The development of a code requires the trained worker, the trained brain, and the co-operation of every branch of the industry. The various factors which enter into the writing of a code for the plumbing and heating industry, are as follows:

1. Politics. 2. Trade and Industry. 3. Practice and Experience. 4. Ethics. 5. Research.

Politics

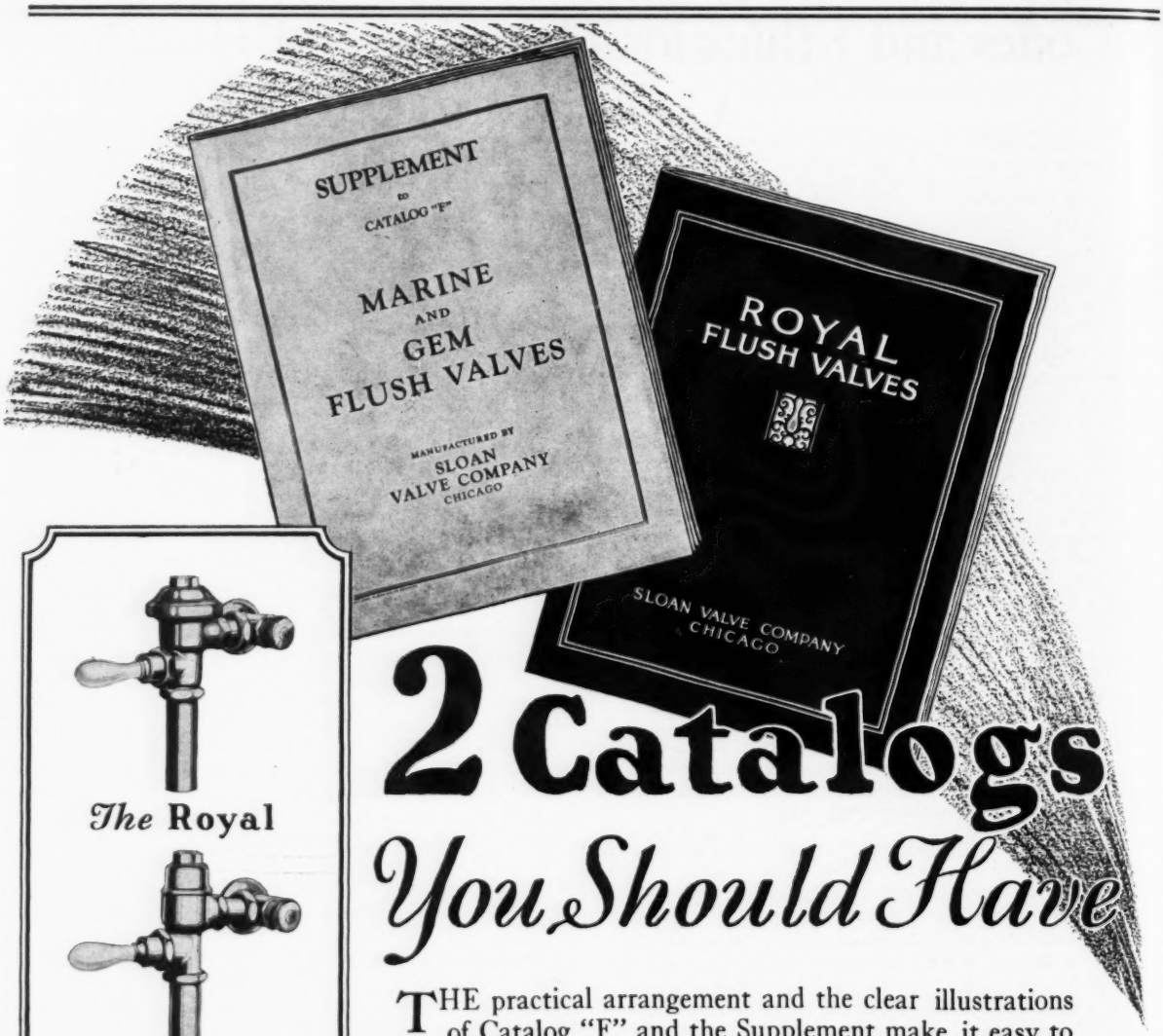
Political control of the office which enforces a code is generally sought for, and the office is converted into a political job. The entire code and its enforcement should be placed in a department away from political domination. The plumbing code is too vital to public health to be abused. State or national control is better than local control. Many plumbing codes have been forced through, legalized, and operated through political pressure, only to be changed or thrown out with the coming of a new administration. Plumbing inspectors in some localities are very apt to be influenced by interests other than those for which the code was written. Positions for inspectors should be filled by persons who pass an examination especially prepared. Appointments to positions should be made in territories away from the home town of the inspector. So-called political influence can readily be used to overlook code requirements, and a code should be so written that this influence will be entirely abolished.

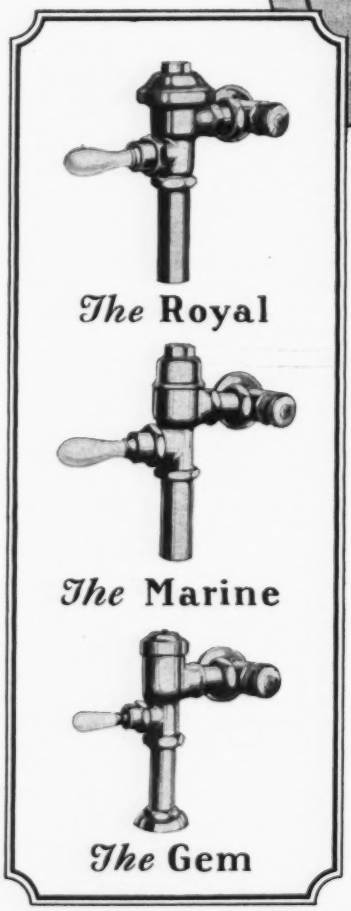
Trade and Industry

There are four forces which should co-operate—contractor, organized labor, manufacturer, and jobber. The contractor feels that he needs a code to protect his business. This is not so. He needs it to protect the health of the public. Organized labor feels that the code may be changed and thus cause less work; whereas, simplified installation would create more or as much work. The manufacturer is interested naturally in codes to see that conditions are not incorporated regarding equipment which would be hard to manufacture. This is also true of the jobber. These four groups could work together in such a manner that they would represent a solid front, all agreeing on a common code. They are working for a code that will establish healthier conditions in homes. Each one has a part in this scheme. The contractor is to see that a proper price is received for work done, to organize good practice, material and labor on the jobs, and to give perfection to the completed work. The manufacturer's part is to produce plumbing fixtures of such caliber that they are sanitary in their make-up; that the materials in the fixtures are non-absorbent, and can be thoroughly flushed and cleansed with plenty of water; that they are strong and substantial, and that they are easily operated and installed. The manufacturer is constantly on the alert for improvements that will make his goods meet the strictest sanitary exactments. Organized labor is interested to the extent of performing perfect workmanship—the proper line of pipes, setting and connecting fixtures in such a way that they meet all sanitary requirements. One of the most important things with which labor has to contend today is

(Continued on Page 57)

*Excerpt from paper read at the recent annual Three-Day Institute in Plumbing and Heating at the Carnegie Institute of Technology in Pittsburgh, Pa.





2 Catalogs *You Should Have*

THE practical arrangement and the clear illustrations of Catalog "F" and the Supplement make it easy to select the right type of flush valve for any class of building. The addition of the Marine and Gem to the well-known Royal, provides a trinity of flush valves that meets every requirement.

. . . the Royal for fine installations where flushing equipment must meet the most exacting demands for quality and service.

. . . the Marine for moderate-priced buildings, and for localities where the water is dirty or sandy.

. . . the Gem for structures of the cheaper class.

A request sent to the Sloan Valve Company, Chicago, will bring you both the Royal Catalog and the Marine and Gem Supplement free.

SLOAN VALVE COMPANY—CHICAGO

Branches in All Principal Cities

MARKETS

BUSINESS REPORTS FROM LARGE JOBBING CENTERS

Prices On Brass Valves and Fittings Are Raised

TRADING activities in the plumbing and heating materials' market throughout most of the large jobbing centers continues to progress along much the same lines that have prevailed since the second week of this month. While buyers for wholesale houses are watchful lest they possess too heavy stocks when inventory time rolls around, their turnovers are such as to make frequent re-ordering necessary, and, as a consequence, manufacturers in most lines are getting quantities of business that total well for this season.

The anticipated higher prices on brass valves and brass fittings became a reality this week with the announcement by a large number of manufacturers of an approximate 5 per cent advance in their prices to wholesalers. The other types of fittings were not changed in price. Most manufacturers are able to grant prompt shipments.

New building and engineering work contracted for in the 37 states east of the Rocky Mountains during the past month was the highest October contract total on record, according to F. W. Dodge Corporation. Last month's total, $597,103,500 in amount was 3 per cent ahead of the September 1928 total and it was 6 per cent over the October 1927 total. In comparison with October 1927 the only district covered by this survey to show a decrease was the Central west.The October building record brought the total amount of new construction started in these states since the first of this year up to $5,724,047,600, as compared with $5,359,297,900 for the corresponding period of last year, the increase being 7 per cent.

MIDDLE ATLANTIC

Prices Gain Strength—

A monthly review of the market situation in the Middle Atlantic territory puts most of the emphasis on the price structure. Less than 30 days ago the announcement was made of a sharp advance in soil pipe prices. Following closely on the heels of this came increased prices on cast brass goods, and on November 15 most manufacturers of brass valves and fittings indicated with a new sheet an advance in prices that approximated 5 per cent. These price upturns are taking the market away from buyers and making it distinctly favorable to sellers—a condition that has not existed so outstandingly for some time. On the other hand there seems to prevail no lack of confidence in the market as jobbers are committing themselves generously, and reports have it that in many cases it is the manufacturer who limits the quantity of business booked. It of course has now become an accepted fact that jobbers figure closely on the amount of merchandise they will take in between this time and the first of next year when inventory taking is completed. Nevertheless, their turnovers are good when the lateness of the year is taken into account; and, as a consequence, manufacturers are getting quantities of business that total good tonnages. In but isolated instances are deliveries in any way curtailed.

Construction contracts awarded during the month of October in the Middle Atlantic States (Eastern Pennsylvania, Southern New Jersey, Maryland, Delaware, District of Columbia and Virginia) was the largest October contract total on record for this district, according to F. W. Dodge Corporation. The total, $77,784,500 in amount, was 18 per cent ahead of the September, 1928 record, as well as 61 per cent ahead of the October, 1927, total. The following were the most important classes of work in last month's building total: $34,873,600, or 45 per cent of all construction, for residential buildings; $15,692,500, or 20 per cent, for public works and utilities; $13,078,600, or 17 per cent, for industrial projects, and $4,589,800, or 6 per cent, for commercial buildings. During the first ten months of the year there were $681,129,200 worth of contracts let on new building and engineering work in this territory, being 9 per cent ahead of the amount started during the first ten months of last year. This in itself gives a bright outlook for the industry.

Soil Pipe

Producers of cast iron pipe were pretty much agreed in that during the week this report covers conditions surrounding this industry in the Middle Atlantic territory were similar in many respects to the state of affairs which prevailed during the previous like period. Most wholesalers have enough pipe to liquidate their requirements for a short time at least. Contractor demand is rather limited and did not seem to appreciably heighten over the interest that has been shown for the past 30 days. The market tone is quite firm and makers have indicated no new price attitude. Deliveries are satisfactory.

Pipe—Brass, Steel and Wrought Iron

The sale of pipe seems to be experiencing a rather spotty condition at this writing, mainly in the principal cities of the Middle Atlantic section. For a day or two demand is quiet, then on other days it assumes an aspect of activity that gives rise to the feeling that it is about to give an account of itself similar to that experienced in October. Buyers for jobbing houses are using a great deal of caution in placing orders for brass, steel and wrought

iron pipe and are committing themselves little beyond their probable near future sales. There is nothing at this time standing in the way of a buyer getting shipments promptly. Prices on all long pipe remain, from the manufacturer's angle, steady and unchanged.

Fittings

Price changes in the brass fittings' market have been announced by a large number of manufacturers who have issued new sheets that are approximately 5 per cent higher than those existing since early summer. Prices on cast iron screwed and malleables remain unchanged. Demand during the seven days that elapsed since the last survey did not show any tendency to increase, but, on the other hand, piping contractors seemed to be buying at an even pace which was productive of a fairly good quantity. No difficulty is experienced in obtaining prompt shipments from factories.

Enameled Ware

Transactions in enameled ware during the first half of November are, generally, up to the expectations of producers, some of whom feel that interest has exceeded that of a year ago over the same period. There are others, though, who feel that it is struggling to hold the gains in demand that were attained a short time back. Jobbers are turning over their stocks in about the same proportion that they are placing business with manufacturers, and this procedure is accounting for a fairly extensive volume. Deliveries are uncurtailed. Makers have made no price changes.

Pottery

There is little pertaining to the pottery market that is distinctly fresh. This is, as a matter of fact, descriptive of the industry for the past 30 days. Pottery plants generally are in good production and with nothing beyond normal reserves distribution is well apace. The Middle Atlantic section is contributing its share of business, which is mostly for immediate consumption. Jobbers for the most part are running on trimmed stocks, as inventory taking is almost at hand. Makers are shipping satisfactorily. The price situation has not been disturbed by manufacturers.

Plumbers' Brass Goods

Business in this area involving cast and tubular brass goods is substantially satisfactory. Some manufacturers feel that demand now is holding well with last month and is ahead of a year ago at this time. Few, however, feel that it has been active enough during the past few months to offset the late start this year got. The normal needs of most wholesalers have been filled for the balance of the year, and in some instances a little into January, 1929, but there are numerous operations, on which jobbers' figures are out and no provision has been made, that will be thrown into the market shortly. Most factories are pressed to keep their deliveries prompt, but are succeeding in a satisfactory way. Manufacturers' quotations are exceedingly firm.

Range Boilers

The rate of range boiler consumption seems to have dropped slightly the last few days. Master plumbers are not using the boilers now that they were a month ago, and this is reflected in the buying attitude the jobber assumes toward the manufacturer. Despite this, prices seem to have gathered an atmosphere of firmness, although there has been no actual change announced. Factories are making deliveries as they are wanted.

Boilers and Radiators

Sellers report their boiler and radiator business as being good. Contractors installing heating materials seem to be continuing their operations with but a slight, if any, diminishment in the pace that has existed for the past month or more. Jobbers are taking in heating equipment little beyond the demand they are likely to encounter from their trade in the near future. Manufacturers have made no change in prices. Shipments from the warehouses of makers are prompt.

CENTRAL WEST

Trading Shows Added Strength—

Wholesalers of plumbing and heating supplies operating in this territory say that demand from master plumbers and heating contractors maintained a brisk seasonal pace during the week just ended. And while, in the experience of a number of jobbers, business was slow during the latter part of October and the first few days of this month, it seems to have regained its previous level. This applies to practically all lines, but it is true nevertheless that enameled ware, pottery, brass goods and other finishing materials are leading the procession of material moving into consumption. Boilers, radiators, cast iron fittings and other materials required by contractors installing heating systems are also moving at a lively rate, this branch of the industry now being in the midst of its busy season.

Complaints are heard from some wholesalers operating in the Chicago district regarding collections. Most producers of the commodities covered by this report are in possession of large stocks, and, as a result, wholesalers are able to secure supplies about as wanted. The latter, with an eye on the nearing inventory period, are taking careful account of their holdings before purchasing, but nevertheless, find it necessary to enter frequent orders for replacements in order to keep their stocks at a normal working level. During the week the majority of manufacturers of brass valves and brass fittings advanced their prices to wholesalers about 5 per cent. Prices on the other types of fittings were not changed.

Soil Pipe

There were no new developments of note in the soil pipe field during the week just ended. Reports indicate that practically all producers are in accord on their published quotations, and that the market is firm at the new high level. Foundry stocks are, in most instances, ample enough to enable wholesalers to secure pipe promptly. Pick-ups at local warehouses are frequent, according to manufacturers.

Pipe—Steel and Wrought Iron

Mill shipments, according to wrought iron pipe salesmen in this district, are of a steady nature and new business seems to average well from one week to the next. Mill stocks are of good size and distributors can secure pipe as wanted. Reports from representatives of steel pipe mills indicate that demand is maintaining a pace closely in keeping with this season of the year, little change being apparent from one week to another. Wholesalers are ordering just about as their needs warrant. Prompt shipments may be had from mills. Makers have not altered their published quotations.

Fittings

Most fittings manufacturers find business going along at a fairly satisfactory pace for this time of year. Contractors' calls upon wholesalers are quite steady. This is especially true in the case of cast iron flanged fittings because of the activity in the heating field, but other types are also in seasonal demand. Factories are offering good shipping service. On November 15 a large number of manufacturers of brass valves and brass fittings indicated with new sheets an advance in their prices to wholesalers

that approximated 5 per cent. Prices on the other types of fittings were not changed.

Enameled Ware

When the lateness of the year is taken into consideration, manufacturers' sales of enameled ware seem to be holding at a very satisfactory pace. This can be attributed to the steady needs of master plumbers, which make it necessary for wholesalers to call on their sources of supply for stock replacements in a way that totals well. Jobbers are not stocking any larger quantities than necessary, depending upon the quick delivery service offered by factories. Makers' prices are unchanged.

Pottery

Demand for pottery seems to be holding at a fair level, according to reports from most manufacturers in this district, and the amount of ware being used by master plumbers is about normal for this time of year. Wholesalers are watching their purchases carefully so as not to overstock with inventory approaching. Potters have made no change in prices to their distributors. In general, staple items can be secured from sources of supply about as wanted.

Plumbers' Brass Goods

The price situation continues firm in the cast and tubular brass markets, and business from the standpoint of manufacturers in this territory is satisfactory. Most wholesalers have covered on their normal requirements for the remainder of this year and in some instances the first month of 1929 has been figured in, in this buying. Factories are offering fairly good delivery service.

Range Boilers

Demand for range boilers continues to hold at the fairly satisfactory rate that has prevailed in this market for some time. Wholesalers are purchasing just about as their actual needs warrant. Reports indicate that manufacturers' prices to wholesalers are quite firm at prevailing sheets. Factory shipments are prompt.

Boilers and Radiators

Activity among heating contractors is pronounced, and, as a result, wholesalers and manufacturers of boilers and radiators are busy taking care of the needs of installers. This branch of the industry is now in the midst of its busy season. Factory stocks are of good size and prompt shipments are the general rule. Makers have announced no change in their published prices.

NEW YORK

Business Is Holding Its Own—

While there were few gains in the rate at which business moved in the metropolitan New York territory during the week this report encompasses, there were at least no recessions noted from the good movement of plumbing and heating materials. In some wholesale quarters, where brass goods especially are involved, needs for early 1929 have been considered, but the deliveries will not affect yearly inventories. The long rumored price advance on brass fittings at last became an actuality when most manufacturers announced with new sheets on November 15 an increase in prices aggregating about 5 per cent.

The continuance of a healthy business activity that so many of the interests in this territory feel is impending is rather forcibly substantiated by the report of F. W. Dodge Corporation. The latest release from the statistical bureau of this organization says, "New construction started in the metropolitan district of New York from January 1 through November 9 of this year, amounting to $1,352,229,100, shows an increase of more than $77,000,000, or 6 per cent, over the amount started during the first eleven months of last year. During the week, November 3 through November 9, there was $19,704,000 worth of contracts let for new building and engineering work in this area. This figure shows quite a drop from the amount contracted for during the preceding week. Included in the above figure were the following important classes of work: $12,135,600, or 62 per cent of all construction, for residential buildings; $4,143,500, or 21 per cent, for commercial buildings; $1,311,700, or 7 per cent, for public works and utilities; and $757,000, or 4 per cent, for hospitals and institutions. Last week's contract total made the daily average of contracts let since the first of this year amount to $5,161,200, as compared with a daily average of $4,570,200 for contracts let during the first eleven months of 1927."

Soil Pipe

Jobbers in a few instances at least, it is reported, have begun to align their resale quotations with the new base prices established by manufacturers several weeks ago. Of the prices from the producers' point of view, it may be said that the new quotations, which are firmly implanted, have brought their return more in line with their pig iron and other costs. The movement of cast pipe into consumption is good and, as a consequence, some business has come through to foundries carrying the new prices. No difficulty with deliveries is being encountered.

Pipe—Brass, Steel and Wrought Iron

The demand for brass pipe, which has been well above moderate, continued during the week in about the same channels. The season seems to be treating steel pipe well, as there are contracts made each week for pipe that is intended for new structures. These, however, do not seem to be numerous enough to give each mill a continued maximum of activity and, because of this, they report high and low spots in their sales from week to week. With election out of the way, wrought iron pipe mills report demand as being fairly impressive, considering the lateness of the year. Much, however, depends on the clinching or loss of an order in giving individual tonnages a bright or dull atmosphere. The price situation, which is unchanged, has lost none of its steadiness where manufacturers are concerned. Shipments are unretarded.

Fittings

The news of an approximate 5 per cent price advance on brass fittings broke during the week covered by this review when most producers issued new discount sheets under date of November 15. Prices on malleable and cast iron screwed fittings were not changed. Piping contractors are showing no less interest in fittings and, as a result, no tapering down from the substantial seasonal demand that has held for some weeks is apparent. Jobbers are obtaining deliveries that meet with their satisfaction.

Enameled Ware

The movement of enameled ware into this market during the last month suffers none by comparison with the same time of 1927. Master plumbers are requiring fixtures in fairly good quantities and, while the stocks of jobbers are being pared to a minimum, there is little risk that their trade will suffer because of delayed deliveries, due to the fact that shipments from manufacturers' plants are prompt. Prices have undergone no change in so far as producers are concerned.

Pottery

Business transactions in this territory involving pottery seem to be running apace from week to week. The requirements of plumbing contractors are substantially the same now as they were a year ago at this time and even though some jobbers are found who report lower sales for the year, they contend that current trading is such that at least some of their volume losses earlier in the year will be

reduced. Potters' prices are unchanged. Jobbers are able, through the promptness of shipments from manufacturers' plants, to render their trade deliveries about as they are wanted.

Plumbers' Brass Goods

It is quite apparent that the buying pace that exists in this territory now involving both cast and tubular brass goods is quite a little ahead of last November. Some producing interests though did not encounter as much fresh business during the past week as usual, but they contend shipments from their plants continue in steady volume; others report considerable ordering for January delivery and a less amount for February shipment. Another point that was emphasized by some factory representatives was the larger-than-has-been-usual-quantities individual orders embrace.

Range Boilers

Even in face of the slower demand for range boilers that was gathered in reports for the week, the market from the price angle seems rather steady. Jobbers during the seven days succeeding the first week of the month were apparently able to supply the tapering requirements of master plumbers from their holdings without calling on factories as extensively as heretofore. This, however, is not to be taken that the average stocks of wholesalers are heavy, but rather that factories are making quick shipments whenever the occasion arises.

Boilers and Radiators

Replies to inquiries among manufacturers pertaining to demand seem to be divided between statements that an improvement continues to be noticeable and others that sales are holding their own. This though leaves no question but what boiler and radiator consumption is good. Most producers are looking for interesting first of the year business, basing their calculations on the building program that in this area has met with no let-down since early in the year.

The Stock Market

Par Value	1928 High	1928 Low	Range for Week Ending Nov. 17, 1928	*	High	Low	Close
NP	87	59	Air Reduction Sales Co.	A	87	80¾	84
25	190	130½	American Radiator Co., com.	A	190	169¾	187⅞
100	152	140	American Radiator Co., pfd.	A	142	141	141
25	114	82½	American Rolling Mills Co.	B	102	98½	99⅞
50	106	53¾	Anaconda Copper Mining Co.	A	106	96¾	104¾
NP	81	51⅞	Bethlehem Steel Co., com.	A	81	67¾	80⅞
100	125	116½	Bethlehem Steel Co., pfd.	A	121½	120	121
NP	62¾	27½	Brunswick-Balke-Collender Co.	A	57⅜	51¼	54¾
NP	168¼	90½	A. M. Byers Co., com.	A & E	165	148⅞	160
100	113½	108¾	A. M. Byers Co., pfd.	A & E	113½	112¾	113½
100	140	128	Century Electric Co., com.	F	130	130	130
100	106	101	Century Electric Co., pfd.	F	103	103	103
50	6	3	Chicago Nipple Mfg. Co., "A"	B	5	4⅜	5
50	3	1¼	Chicago Nipple Mfg. Co., "B"	B	1½	1½	1½
25	50	45	Crane Co., com.	C	48	48	48
100	122	118¾	Crane Co., pfd.	C	120	120	120
100	94	67	Detroit Brass & Malleable Works	D	70	70	70
100	109	109	The John Douglas Co., pfd.	H	109	109	109
20	23	17	Eagle-Picher Lead Co.	H	18	17⅜	17⅜
NP	54	32⅞	Fairbanks, Morse & Co., com.	A	45¾	43¾	44½
100	114¾	104	Fairbanks, Morse & Co., pfd.	A	112	110	110
NP	52	27½	Fulton Sylphon Co.	B	52	46	52
NP	12½	8½	Greenfield Tap & Die Corp.	B	12	11½	12
NP	186	96¼	Johns-Manville Corp., com.	A	186	163	186
100	125	120¼	Johns-Manville Corp., pfd.	A	125	124½	125
100	160	150	Jones & Laughlin, com.	A & E	154	154	154
100	124¼	119¼	Jones & Laughlin, pfd.	A & E	121¾	121½	121¾
NP	44	30	Minneapolis-Honeywell Reg. Co., com.	B & C	44	41½	44
100	108½	98	Minneapolis-Honeywell Reg. Co., pfd.	B & C	108½	106½	108½
NP	57⅞	31½	Modine Mfg. Co.	B & C	57	54	54
NP	42	32	F. E. Myers & Bro. Co., com.	G	38	37¾	38
100	105⅜	104½	F. E. Myers & Bro. Co., pfd.	G	104½	104½	104½
100	136	115	National Lead Co., com.	A	122½	120	120¼
100	147¼	139	National Lead Co., pfd. "A"	A	142	140½	141
100	121½	112½	National Lead Co., pfd. "B"	A	118	118	118
NP	40⅜	14	National Radiator Corp., com.	A	18½	17¼	17½
NP	98½	45	National Radiator Corp., pfd.	A	41	40⅜	41
5	34½	24½	Herman Nelson Corp.	B	26½	24½	24½
NP	46	19½	Neptune Meter Co., "A"	B	46	46	46
100	109	104	Ohio Brass Co., pfd.	G	105½	105½	105½
NP	100	85½	Ohio Brass Co., "B"	B & G	92	90¾	90¾
100	101½	100	Penberthy Injector Co., pfd.	D	101½	101½	101½
NP	27	14½	Richmond Radiator Co., com.	B	16	14½	14½
NP	40⅛	32¼	Richmond Radiator Co., pfd.	B	32¾	32¼	32¼
NP	53	26	Spang, Chalfant & Co., com.	A	49¾	46	46½
100	100	97	Spang, Chalfant & Co., pfd.	A	97⅞	97⅞	97⅞
NP	42¼	34	Standard San. Mfg. Co., com.	A & E	36¾	36	36¼
100	128	118	Standard San. Mfg. Co., pfd.	A & E	120	118	120
20	53	45	U. S. Cast Iron P. & F. Co., com. (new)	A	48	45	45¼
NP	19½	18	U. S. Cast Iron P. & F. Co., 1st pfd. (new)	A	18⅞	18	18⅞
NP	19½	18	U. S. Cast Iron P. & F. Co., 2nd Pfd. (new)	A	18⅞	18¼	18⅝
NP	48	38½	U. S. Radiator Corp., com.	B & D	42½	42	42⅜
100	107⅓	101	U. S. Radiator Corp., pfd.	D	102	101½	101½
100	63¼	27	U. S. Rubber Co., com.	A	39½	38	38¾
100	109⅜	55	U. S. Rubber Co., pfd.	A	70¼	66¾	66¾
100	172½	132¾	U. S. Steel Corp., com.	A	172½	163¼	171½
100	147¼	138¾	U. S. Steel Corp., pfd.	A	141¾	141	141¼
NP	26⅞	14½	Walworth Co.	A	24¾	23½	23½
NP	52	32	Wayne Co., com.	B & C	33	33	33
NP	52	44	Wayne Co., pfd.	B & C	44	44	44
100	96	72	Wheeling Steel Corp., com.	B	96	80¾	96
100	126½	125	Wheeling Steel Corp., pfd. "A"	B	126½	126½	126½
100	135½	135½	Wheeling Steel Corp., pfd. "B"	B	135½	135½	135½
NP	22	6½	Williams Oil-O-Matic Htg. Corp.	C	18	17	17⅞
NP	106⅞	83½	Youngstown Sheet & Tube Co.	A	100¼	95⅞	99½

*Where listed—

A—New York Stock Exchange
B—New York Curb Exchange
C—Chicago Stock Exchange
D—Detroit Stock Exchange
E—Pittsburgh Stock Exchange
F—St. Louis Stock Exchange
G—Cleveland Stock Exchange
H—Cincinnati Stock Exchange

The Metal Market

	Nov. 20	Average Oct., 1928	Average Aug., 1928	Average 1927
PIG IRON—				
No. 2 foundry, Chicago, Furnace	$20.00	$18.80	$17.60	$19.66
PLATES AND SHEETS—				
Steel boiler plates, Pittsburgh, per lb.	1.90c	1.95c	1.85c	1.83c
Blue annealed sheets, No. 10, Pittsburgh, per lb.	2.00c	2.00c	2.00c	2.20c
Black sheets, No. 24, Pittsburgh, per lb.	2.75c	2.70c	2.65c	2.91c
TIN—				
Straits tin	50½c			
LEAD—				
Chicago	6.10c			

The Old Metal Market
Dealers' Buying Prices

	Per lb.		Per lb.
Aluminum clippings	18 c	Copper, light	11½c
Block tin	46½c	Copper, uncrucibled wire	12½c
Brass, light	7¾c	Faucets and valves	10½c
Brass, heavy mixed	8¾c	Lead, heavy	5.50c
Brass, red	11 c	Solder joints	9½c
Copper, crucible	13¼c		

NOTE: Prices are those quoted on Tuesday of this week.

NEW ENGLAND

Shipments Continue At Steady Pace—

There was no apparent fluctuation in demand for plumbing and heating commodities in this section during the past seven days. Comments are frequently made on the effect which approaching cold weather has on construction activities, but, if taken from expressions of a number of wholesalers, consumption demands are still running high, the past eight weeks continuing to grant the highest volumes of the year. It is true that inceptions of new work have fallen off, but finishing installations on buildings of the larger type and on residences which were

(Continued on Page 83)

Codes and Ethics

(Continued from Page 51)

the intense and keen competition which is constantly pushing mechanics to turn out greater quantities of work with less quality. Skill today is on the decline, and steps must be taken to make it prominent again, or the sanitary features of plumbing installations will be very seriously retarded. The jobber is interested to see that he sells to men who are competent to install, and that he handles equipment and piping which bear the mark of the best sanitary requirements. All of these forces working together and co-operating in every respect will meet the desired end.

Practice and Experience

In compiling a code, it is well to consider present practice and experience. However, it is impossible to develop a working code in this way; first, because local practice differs, and experience is the result of local practice, and these vary in each locality, and second, because handed down experiences are very firmly fixed in our methods, and are so different that it is difficult to have all agree upon one idea. Some agency broader than practice and experience must enter into code writing. Medicines which cured illnesses thirty years ago are not used today, so also do practices in plumbing and heating change. What practice and what experience go into a code are dependent upon votes and not upon correct methods. A code developed by votes is but a compilation of opinions. The common practices of plumbing and heating installations of today and of yesterday will be superseded by new ways as soon as more information is developed regarding plumbing.

Ethics

When compiling a code, ethical methods must be considered, and in no way should anything but the best practice influence the writing of a code. Unbiased judgment must be used, the attitude must be right, and information must be sought from sources above influence and away from commercial contact. The code is written not for the benefit of the plumbing industry, but for the benefit of public health. When sight is lost of this fact, the enforcement of the code will weaken. With this point of view of public health, agreements and decisions can be reached with accuracy and perfection.

Research

All these foregoing factors which appear in code writing —politics, trade and industry, practice and experience, and ethics should have a minor effect upon the finished code. The result of research work should be the major influence. Research can settle for us the many things in plumbing which are not known. The fact that plumbing is being installed today in all types of buildings and under various conditions does not mean that the industry possesses all the correct information, nor does it mean that it has realized ideal conditions. This is easily proved by at least one fact that will be used as an illustration. In New York, every closet bowl is back vented from the waste connection; in Pennsylvania, no back or reventing is required. Can it be said that the New York plumber or the Pennsylvania plumber is right? Correct information—of what does it consist? It consists of data obtained from research, and in this connection two distinct thoughts might be introduced: First, the physical side of each problem which must be thoroughly investigated, and second, what the effect of results found through research will be on the health of the public.

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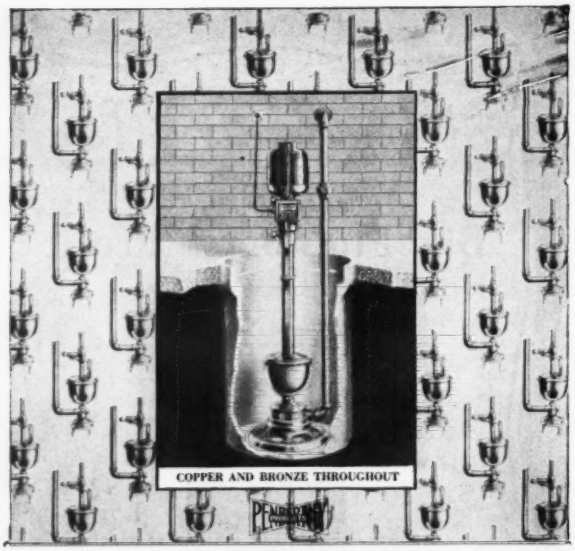

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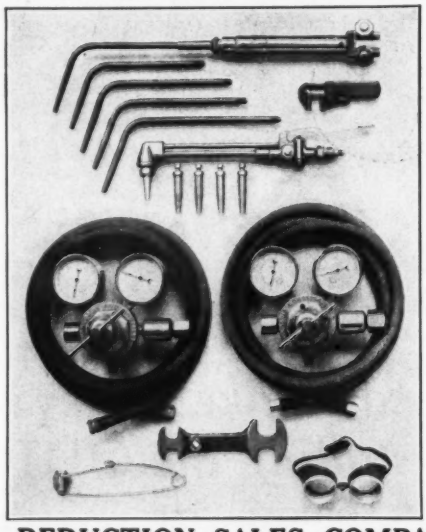

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66 Plants — 21 District Offices

relieved equally as well? How is loss of trap seal affected by syphonage and evaporation? Does the connection function a hundred per cent after usage? Is the danger from drain air and vermin greater or less? What is the investment with each and what the amount of labor with each? Matters of this kind cannot be settled at the present time except by a majority of opinions, which, of course, will not definitely settle the question, but a thorough investigation would prove one or the other wrong, and thereafter codes could be based on correct practice.

The plumbing and heating industry has built up a system of installation, and now with the increase in the number of large buildings and the thickly populated sections, it has become more complicated. For a long time it has been the desire to look upon this industry as an engineering profession. As is known, this has been realized at the Carnegie Institute of Technology with the establishment of the Theodore Ahrens professorship. However, if the industry is to be looked upon as an engineering profession, it is imperative that its codes be founded on solid engineering lines. The industry can no longer stand for guesswork and opinions. The code of Certified Heating is based on engineering data, so is the Warm Air Heating code. When the code of one state differs from the code of another, there must be an attempt to make them uniform. Engineering practice demands it. Local ideas must be cast aside or harmonized with fundamental data. In this manner only can the plumbing code be made of engineering value.

The research program which was presented by the author last year was a step toward the beginning of actual research work. To be consistent, it is proper that all plumbing research be placed under one head, and the past year has been spent in attempting to find the controlling body. When the research program starts, it should be the source of fundamental information for the entire country.

With the above five factors, politics, trade and industry, practice and experience, ethics, research, all focused on and working toward a code built up from fundamental data, the industry would present to the public one of the best safeguards in existence for public health. A feeling must be established and a demand created for a rigid code; hard but not tricky examinations for masters should be given; a slogan should be started: "More and Better Plumbing," "Good Plumbing, Better Health, Greater Happiness," "Cheap Plumbing, Poor Health, Sorrow, Sickness."

Plumbing Examinations

Examinations for journeymen and masters should be held in the nearest college, where there is an atmosphere of learning, and the examinations should be held under the same stringent rules as are held the examinations for the college graduate before he is granted his degree. The way to keep uninformed individuals out of the industry is not necessarily to build up a political wall, but rather to make the requirements more severe. There should be no so-called backdoor through which those who do not know enough can enter the profession. The examinations for master plumbers are too easy. As the industry develops along engineering lines, the codes will contain more engineering data and fewer general statements; and the examinations which are now so simple will become more difficult, particularly those for the masters.

Codes and Ethics

It is not desired to keep anyone out of an industry by means of legislation, nor is it desired to bring in anyone who does not have sufficient knowledge to carry on the work and enforce codes. Certified heating is a much surer way of keeping uninformed men out of the heating in-

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Lead Pipe is distinctive to the plumber. It has been his exclusive mark of craftsmanship for centuries, being as old to the plumbing trade as tradition itself. And throughout the hundreds of years of its use, Lead Pipe has demonstrated that it can be depended upon to stand up on the job.

You, as a plumbing contractor, know the true worth of Lead Pipe.

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Enough **DOLE AIR VALVES** *in satisfactory use to service the residential sections of New York, Chicago and San Francisco*

THE Heating Trade knows what it means to "Depend on *Dole*" for good air valves. Selling *Dole Valves* means more than an immediate profit. It builds goodwill and brings repeat orders. You, too, should sell *Dole Syphon Air Valves.*

Automatic All Metal **Dole** *Non-adjustable Thermostatic*

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The Dole Valve Company, 1913-33 Carroll Ave., Chicago, Ill.

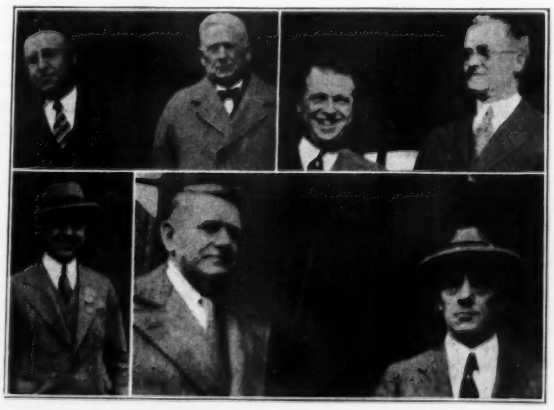
dustry than is the present plumbing code in keeping uninformed men out of the plumbing industry. Too much thought is spent on the woes and evils of the plumbing and heating business, and not enough on perfecting the code and requirements. It has been said that business is to be keener and competition greater. To offset this, why not demand more information from the men who apply for entrance? Why not have the college, which is thoroughly experienced in giving tests, house the examining board, and compile an examination of sufficient caliber to meet the dignity of the task of master contractor?

State Codes

Of what value is a rule in a home if it applies only to one room? Of what value is a rule in a school to the effect that all lessons must be recited, and then have it apply only to one lesson? Of what value as a health measure is a rule which provides a state code and then applies it only to a few localities throughout the state? A state code should be passed to apply to all communities in the state except federal. Every plumber who works at the trade should do so under a code, and only his personal way of handling work should differ. The Federal Suggested Minimum Requirements Code should also be in the hands of every contractor, and he should acquaint himself with its provisions. Certified Heating, barring climatic conditions, is a national code.

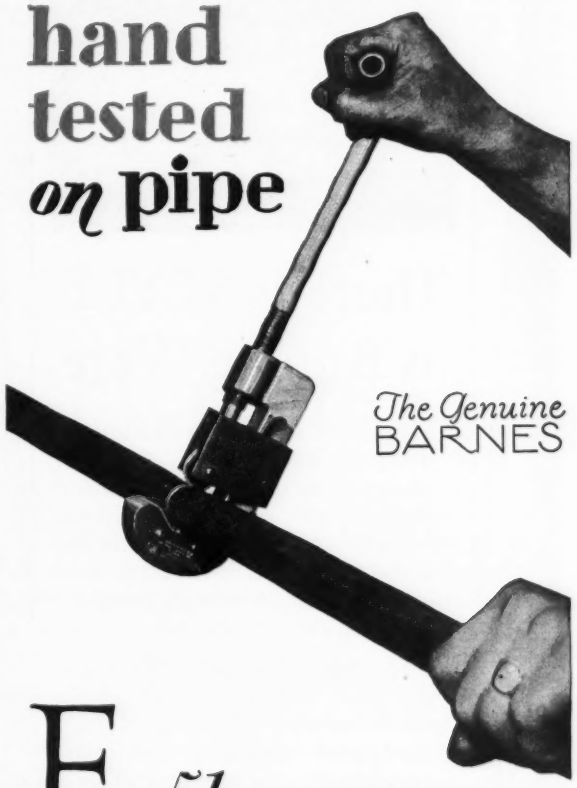
A research program properly working can, in time, give a definite answer to many of the code problems, and it is the only way in which information for a proper code can be secured. Contractors in an industry interested in maintaining and installing sanitary conditions, have not allied themselves sufficiently with the sanitary side of the industry; that is, they are not co-operating with the sanitary engineers, the public health organization, and the medical group sufficiently. The plumbing industry should have a standing committee to co-operate with these organizations to bring about better sanitary conditions and better written codes.

One of the best ways in which a code can be improved is to furnish a sketch of each written section. The interpretation of the written word by a sketch is good practice; it leaves no doubt. The more drawing available, the fewer opportunities there will be for opinions to creep in regarding the exact meaning of the code. One of the finest things the master plumbers' associations of the states



Top row: C. W. Rich, assistant manager of Crane Co., Rochester, N. Y.; P. M. Beecher, sales manager of Samuel Sloan & Co., Rochester; Chester Bess, Grabler-Republic, Inc.; W. G. Shafer, of W. G. Shafer Co., Inc., Syracuse, N. Y. Bottom row: Chester Bess of Grabler-Republic, Inc.; W. A. Thompson of Rochester, H. B. Smith Co.; F. N. Hoeffer, F. N. Hoeffer Co., Rochester, N. Y. Photos taken at the recent convention of the New York State Association of Master Plumbers

Each cutter hand tested *on* pipe



For 51 years The Barnes Tool Company has specialized in the manufacture of the most satisfactory pipe-cutter.

In the production of Barnes wheels, we employ methods in tempering and hardening which science and experience have taught us produce the utmost durability. The *genuine* Barnes knife-blade cutter-wheel is a steel drop forging . . . . not cut from bar stock.

Every *genuine* Barnes of every size is *hand-tested on pipe* before it leaves the factory.

You'll find this red tag on every Genuine Barnes

WHEN you place your next order, be particular to specify "the Genuine Barnes Three-Wheel Pipe Cutter." Then you can be sure of a perfect tool that will *"cut true and last a lifetime."*

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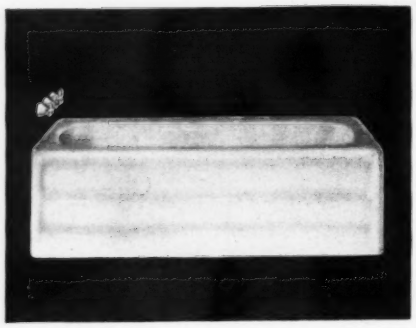

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You'll find no extreme, faddish designs that will be old tomorrow, in the Rundle line. Every piece of Rundle Ware radiates dignified style that is always new—as lasting as the life-time, snow-white Rundle enamel.

The style of Rundle Ware is the kind that people of today want in their homes—the kind that makes a fine impression in the dealer's store and builds volume sales.

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PLUMBERS' SANITARY ENAMELED WARE
BRASS AND IRON GOODS

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could do would be to employ someone to draw code interpretations clearly and exactly, and to encourage each locality to do the same.

A code like the plumbing and heating code should be in a state of flux—that is, it should be added to or changed as new developments appear without changing the status of the balance of the code.

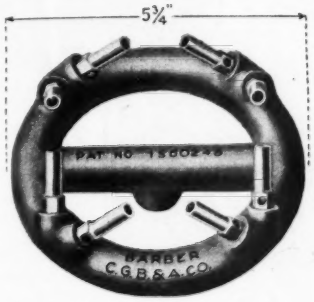
What is true of plumbing is true of heating. There should be some regulations for the installation of heating to insure the owner that he is getting value for the money expended by him. Certified heating is a step in this direction, and is proving to be of value wherever it is being enforced. The warm air heating manufacturers, together with the various heating organizations interested, have formulated a code which is now being perfected and adopted in different cities, looking toward the proper installation of warm air heating. As an illustration of what a code and research can do for an industry, the warm air industry is cited. A few years ago, this industry was on a very precarious basis. Men were installing work who knew nothing about warm air heating, with the result that, as a heating system, warm air was being looked upon as being almost on a par with the old parlor stove. With the intensive research program carried on by this industry, and a successful attempt to write a code for the installation and control of installations and output, this industry has made a tremendous advance. To some this is a very surprising state of affairs, but it only goes to prove that any one industry that will support a research program and develop codes based purely on sound fundamental engineering basis, cannot help but progress and turn out more in dollars and cents at the end of each year. The American Society of Heating and Ventilating Engineers, with its research bureau located at the Bureau of Mines, Pittsburgh, is doing a wonderful work in developing fundamental heating data. All of the work that the heating engineers are doing, particularly in pipe sizes, is being supported and assisted by the Heating and Piping Contractors National Association, and these two organizations, the one dealing solely with the theory and the other dealing solely with the practical application, have co-operated and are both working toward information which will be of value to all. In the last issue of the "Guide," the official publication of the American Society of Heating and Ventilating Engineers, appeared the first set of tables which have been developed in conjunction with the heating engineers and the piping contractors—a set of tables which is authentic and which has been agreed upon by these two groups. Material of this kind written into a code will give the industry stability and accuracy that in no other way could it get. The plumbing industry must seek in like manner to obtain information to write into its codes.

Larger Italian Consumption of Lead and Zinc

Italy's consumption of lead and zinc metal, especially the former, has been steadily increasing in recent years. In 1913 the total Italian consumption amounted to 32,591 tons of lead and 16,583 of zinc; in 1926 it increased to 44,674 tons of lead and 18,068 of zinc. While Italy is a not unimportant producer of lead and zinc metal, its requirements can not be met without a considerable importation to supplement the domestic production. Imports of lead metal in recent years have varied from about half to slightly more than the domestic production; in 1927 the country produced a total of 23,774 tons of lead and imported 16,672 tons. Imports of zinc in recent years have been considerably in excess of domestic production. In 1927 Italy produced 7,367 tons of zinc metal and imported 9,578 tons to supplement the domestic output.

BARBER PATENTED JET GAS BURNERS

Best by Test *for* Water Heaters—



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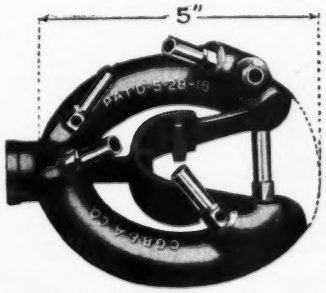

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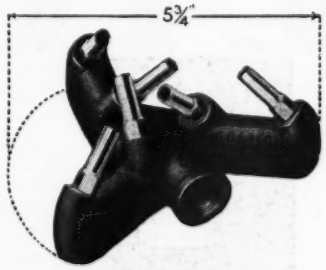

No. Y-10 Burner

Why?—Because Barber Burners possess many outstanding and exclusive features that make them highly dependable, efficient, and free from service troubles. The economy, reliability, and superior service rendered by Barber Burner equipped gas appliances have built up a powerful consumer demand for them—reducing sales resistance to an absolute minimum.

Insist upon Barber Burner equipped Water Heaters and other Appliances—watch your sales increase, profits grow, and service troubles disappear.

Barber Burners are made in a large variety of designs and capacities to meet the exact requirements of all types of gas appliances.

Among the many Manufacturers who have adopted Barber Burners as standard in their Water Heaters, and other Appliances are the following:

Akron Equipment Co.
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Bryan Steam Corp.
Carrier Engineering Corp.
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Champion Dish Washing Machine Co.
Coast Heater Mfg. Co.
Cole Mfg. Co.
Dahlquist Mfg. Co.
Day & Night Water Heater Co.
Economy Heater Co.
Electro Weld Co.
Firestone Tire & Rubber Co.
Franklin Plumbing Supply Co.
R. E. Fraser & Co.
General Gas Furnace Co.
Geneva Heater Co.
Gewert Mfg. Co.
E. A. Hibbs
Hoffman Heater Co.
Hollywood Water Heater Co.
Hotstream Heater Co.
Hoyt Heater Co.
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Lovekin Water Heater Co.
Marlow Manufacturing Co.
McCann-Harrison Co.
Merit Mfg. Co.
Walter Mork Co.
Newell Mfg. Co.
New Way Mfg. Co.
Northwestern Steel & Iron Works
Ohio Heater Co.
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Sands Mfg. Co.
Schwab Boiler & Machine Co.
Snap-O-Stat Co.
Star Dee Water Heater Co.
Stinson Sales Co., Inc.
John Trageser Steam Copper Works
United Heater Corp.
Vernon Edler Corp.
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TO MANUFACTURERS: The services of our Engineering Department and Testing Laboratory are at your disposal for determining the correct application of Barber Burners to any type of heating device. Write us today.

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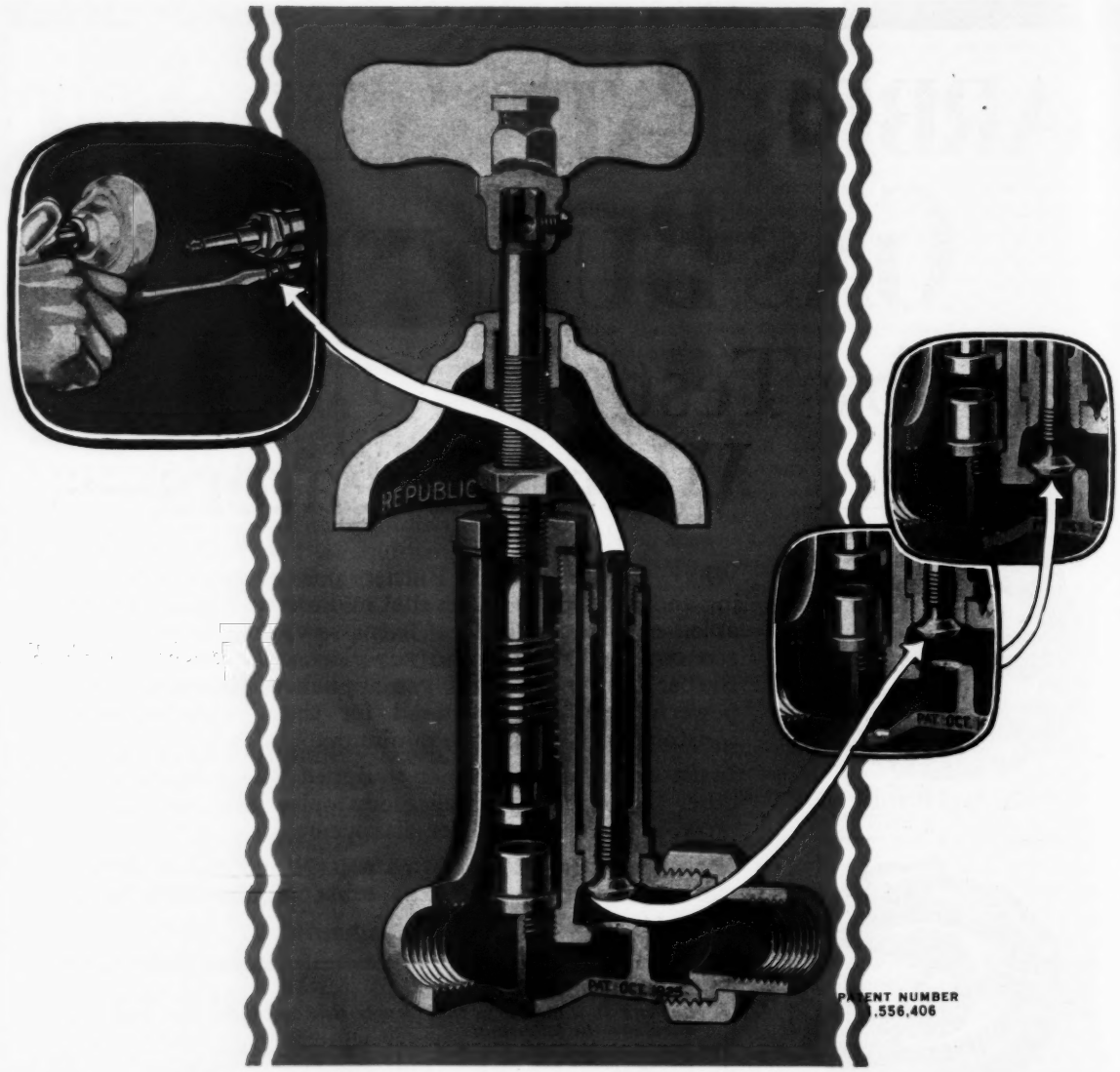

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A REPUBLIC FIXTURE equipped with the Republic Integral Stop Valve possesses *added salability.* Why? Because your customers attach a definite degree of value to the time and step saving conveniences built into this fixture.

Republic Demonstration Books show how you can *make more sales easier at greater profit* by selling Republic Fixtures. Write for copies today.

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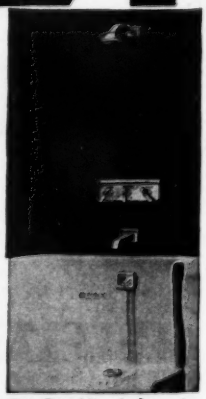
The Republic Ambassador Lavatory Fixture No. 937

PATENT NUMBERS
1,647,984
1,556,406



The Republic Ambassador Bath and Shower Fixture No. 1242

PATENT NUMBERS
1,332,793 1,556,406
1,579,503 1,647,984
1,187,477 17,034

The modern Plumber's Tag identifies the plumbing contractor in the minds of home buyers as a quality craftsman and as a progressive business man.

THIS WEEK

AMONG MANUFACTURERS, WHOLESALERS AND SALESMEN

OPEN NEW SUPPLY HOUSE IN OSSINING

Announcement is made of the formation of the Ossining Plumbers Supply Co., Inc., with headquarters at 102 North Highland avenue, Ossining, N. Y. The new concern, which is capitalized at $25,000, is headed by E. H. Ellis, as president. Other officers are: Leopold Brodie and I. Vogel.

Mr. Ellis has had 26 years experience in the plumbing and heating supplies line, including 14 years with Crane Co., and four years with the United Plumbers Supply Co., New York City. Until recently he was manager of the latter company's Yonkers branch. Mr. Brodie has also had many years experience, the last three as assistant manager in the New Rochelle and Yonkers branches of the United Plumbers Supply Co. Mr. Vogel is an attorney. The new firm hopes to open its doors to the trade by December 1.

INCORPORATES TO DO BUSINESS IN CALIFORNIA

The United States Cast Iron Pipe & Foundry Co., Burlington, N. J., has filed articles of incorporation in Los Angeles County preliminary to doing business in California.

FORM LEAD INDUSTRIES ASSOCIATION

A Lead Industries Association was formally organized November 14 by producers and consumers of lead. In general the association intends to promote the serviceability of the lead industries to the community at large, and will parallel some of the activities of existing organizations in other non-ferrous metal industries. The association also expects to disseminate accurate information regarding the use of lead products; to collect statistical information relating to the production, distribution, marketing and consumption of lead and lead products, and to develop methods for improving the welfare of those engaged in the lead industries.

Membership in the Lead Industries Association will comprise corporations interested in the mining, smelting or manufacturing of lead in the United States, Mexico, Canada and South America. Some of the companies to be represented in the organization are Ahumada Lead Co., American Lead Co., American Metal Co., Andrews Lead Co., American Smelting & Refining Co., Bingham Mines Co., Bunker Hill and Sullivan Mining and Concentrating Co., Cerro de Pasco Copper Corp., Chief Consolidated Mining Co., Consolidated Mining and Smelting Co. of Canada, Ltd., Eagle-Picher Lead Co., El Potosi Mining Co. (Howe Sound Co.), Evans-Wallower Lead Co., Federal Mining & Smelting Co., Federated Metals Corp., Fleck Brothers Co., W. P. Fuller & Co., General Cable Co., Glidden Co., Hecla Mining Co., Metals Refining Co., National Lead Co., Northwest Lead Co., Park-Utah Consolidated Mining Co., Remington Arms Co., Sherwin-Williams Co., Silver King Coalition Mines Co., St. Joseph Lead Co., Tintic Standard Mining Co., Utah Apex Mining Co., Utah Copper Co., United Metals Selling Co., U. S. L. Battery Corp., United States Smelting, Refining & Mining Co.

The following officers of the association were elected at the meeting: Clinton H. Crane, who is president of St. Joseph Lead Co., president; Hamilton M. Brush, who is vice president of American Smelting & Refining Co. and Ralph M. Roosevelt, who is vice president of Eagle-Picher Lead Co., vice presidents; Felix E. Wormser, secretary-treasurer.

J. W. OLIVER CALLED BY DEATH

J. W. Oliver, first vice president of the Standard Sanitary Mfg. Co., died at his home at Sewickley Heights, Pa., at 11:00 a. m. Wednesday, November 14, after an illness of only two days' duration. Mr. Oliver was born on a farm near Elmira, Ill., in 1872. His education began at a country school, followed by a high school course at Audubon, Iowa. He worked his way through Iowa State

J. W. Oliver

College by teaching, graduating at the age of twenty-three. He completed a night course in Chicago College of Law, and was admitted to practice in the State of Illinois.

In 1897, Mr. Oliver was appointed manager of the San Francisco branch of the Aermotor Co., Chicago, and five years later was made manager of the wrought pipe plant of that company, at Chicago Heights, Ill. In 1903 he was employed by the Ahrens & Ott Mfg. Co., Louisville; in 1911 he was made assistant manager; in 1913, manager of Louisville branch. In 1918 he became general manager of the Ahrens & Ott Division of Standard Sanitary Mfg. Co., embracing seven principal branch houses and three sub-branches. He was elected a director of the Standard company in April, 1919, and elected secretary-treasurer with offices at Pittsburgh, May 15, 1919. This position he held until January, 1924, when he became first vice presi-

dent and chairman of the executive committee, which position he held until the time of his death.

Mr. Oliver had two terms as president of the Louisville Board of Trade, and was chairman of the Louisville War Industries Commission. He was a member of the Pittsburgh Club, Duquesne Club, University Club, Keystone Athletic Club, Pittsburgh Athletic Association, Highland Country Club and Edgeworth Club, all in Pittsburgh, and of the Louisville Country Club, Pendennis Club and Kosair Temple, A. A. O. N. M. S., of Louisville, Ky. He is survived by his wife, a daughter, Martha Jane, and a son, William, all of Sewickley Heights, Pa., and by four sisters.

BUILDS NEW ADDITION TO PLANT

The Union Malleable Mfg. Co., Ashland, Ohio, is erecting an addition to its plant in that city. The addition will be used for the pattern department, and will also include additional machining space.

Sales Volumes Analyzed in Harvard Report

THE following is taken from the study made by the Harvard Bureau of Business Research in co-operation with the Central Supply Association, on the operating expenses of plumbing and heating supply wholesalers in the Central States for the year 1927. A short time ago another section of the survey was published in which the common or typical percentage figures for all firms reporting were analyzed. As previously mentioned, the wholesalers in this district reporting to the bureau, on the average, suffered a net loss of 0.6 per cent of net sales.

The accompanying table shows the figures for all firms reporting, and for these firms divided into three groups according to volume of sales. In the first group are included 60 firms whose sales were less than $500,000; in the second group, 42 firms whose sales were between $500,000 and $1,000,000; and in the third group, 32 firms whose sales were over $1,000,000.

In general, the large firms made the best showing in 1927. The group of firms with sales over $1,000,000 was, in fact, the only one which commonly showed a net profit after including interest among the expenses. Conversely, the greatest loss in ratio to sales was sustained by the group of firms with sales less than $500,000. The better showing of the large firms was attributable primarily to lower expenses. These firms did not characteristically obtain a higher gross margin—the over $1,000,000 group, in fact, showing a gross margin of only 19.1 per cent of net sales. But on the other hand, the total expense of this

Common Figures of 134 Wholesalers According to Volume of 1927 Sales

Net Sales = 100%

Item	All Firms Reporting	According to Volume of Sales		
		Under $500,000	$500,000 to $1,000,000	Over $1,000,000
Number of Firms	134	60	42	32
Typical Sales Volume	$620,000	$350,000	$640,000	$1,350,000
Net Cost of Merchandise Sold	**79.8%**	**79.6%**	**79.4%**	**80.9%**
Gross Margin	**20.2**	**20.4**	**20.6**	**19.1**
Operating Expenses:				
Salesforce Salaries, Commissions, and Bonuses	**3.4**	**3.7**	**3.2**	**2.8**
Salesforce Travelling Expense	**1.6**	**1.5**	**1.8**	**1.25**
Total Salesforce Expense	**5.0%**	**5.2%**	**5.0%**	**4.05%**
Advertising	**0.3**	0.3	0.3	0.25
Other Miscellaneous Selling Expense	**0.2**	0.2	0.2	0.2
Warehouse, Store, Receiving, and Shipping Wages	**2.3**	2.1	2.4	2.3
Warehouse, Store, Receiving, and Shipping Supplies	**0.15**	0.1	0.15	0.15
Total Delivery Expense	**1.2**	**1.3**	**1.0**	**1.4**
Executive Salaries	**2.3**	**3.0**	**2.2**	**1.45**
Office Salaries and Wages	**2.7**	2.5	3.1	2.65
Office Supplies, Postage, and Stationery	**0.4**	0.45	0.4	0.4
Telephone and Telegraph	**0.25**	0.25	0.25	0.25
Rent	**1.6**	1.7	1.6	1.5
Heat, Light, Power, and Water	**0.2**	0.2	0.2	0.15
Taxes	**0.4**	0.4	0.4	0.3
Insurance	**0.25**	0.3	0.2	0.2
Repairs and Depreciation	**0.2**	0.2	0.2	0.2
Losses from Bad Debts	**0.55**	0.55	0.6	0.6
Legal and Collection Expense	**0.15**	0.15	0.15	0.1
Dues, Subscriptions, and Contributions	**0.2**	0.25	0.15	0.1
Miscellaneous	**0.35**	0.35	0.4	0.35
Total Expense before Interest	**18.7%**	**19.5%**	**18.9%**	**16.6%**
Total Interest	**2.1**	**2.4**	**1.8**	**1.9**
Total Expense	**20.8%**	**21.9%**	**20.7%**	**18.5%**
Net Profit or Loss	***Loss 0.6***	***Loss 1.5***	***Loss 0.1***	**0.6**
Interest and Rentals Earned and Other Sundry Revenue	**2.3**	2.5	2.0	2.2
Total Net Gain	**1.7**	**1.0**	**1.9**	**2.8**
Rate of Stock-turn (times a year)	**4.0**	**3.1**	**4.1**	**5.0**
Percentage of Brokerage Sales to Total Sales	**3.0%**	**1.1%**	**3.5%**	**6.0%**

Note—The figures shown in boldface type indicate the more significant variations according to the volume groups.

group—only 18.5 per cent—was lower by almost 3.5 per cent of net sales than the figure of 21.9 per cent for the group of firms with sales of less than $500,000.

To a certain extent the lower gross margin figure for the large firms may be attributed to their larger proportion of "brokerage" sales—that is, direct shipment sales made at a low gross margin. In order to test this factor, a special computation was made of the gross margin after eliminating the amount of brokerage sales from the net sales figure and the cost of such sales from the figure for total cost of merchandise. For the large volume group the common gross margin figure, after making the adjustments just described, was found to be 20.3 per cent. The adjusted gross margin figures for each of the volume groups were as follows:

Volume of Sales	Common Figure for Gross Margin	Per Cent of Brokerage	Gross Margin with Brokerage Eliminated
Sales under $500,000 (60 firms)	20.4%	1.1%	20.7%
Sales $500,000 to $1,000,000 (42 firms)	20.6	3.5	21.2
Sales over $1,000,000 (32 firms)	19.1	6.0	20.3

Thus, even after taking into consideration the larger volume of brokerage business on the part of the large firms, it remains apparent that they commonly operated on a lower gross margin even on regular sales than did the smaller firms. The element of brokerage sales also affects the expense percentages to a certain extent. As expense ratios are based on net sales, including brokerage, they will tend to be slightly lower when a considerable proportion of brokerage sales is included in the net sales figure, since the expenses incurred in connection with brokerage sales ordinarily are less than are those on regular sales. Even after giving due consideration to this factor, however, there is little doubt that the expenses of the larger firms were on the whole lower in proportion to sales than was the case for the smaller firms.

Among the individual expenses in which economies were apparent on the part of the larger firms, the items of Total Salesforce Expense, Executive Salaries, and Total Interest showed the most marked differences, as may be seen in the table on page 66.

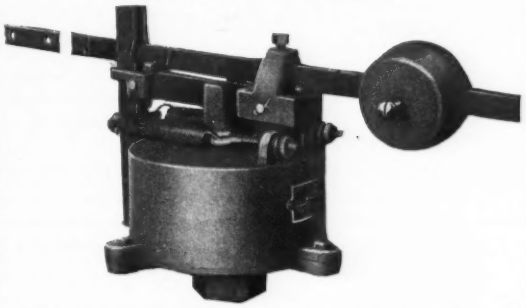
One exception to the tendency for the larger firms to have lower expense ratios was found in the item of Delivery Expense, which, for the firms with sales of over $1,000,000, was slightly higher than for either of the other volume groups. This condition is natural, since many of these large firms were in large cities where delivery expense characteristically was higher, as may be seen from the analysis of figures for firms grouped according to size of cities in which they were located.

The rate of stock-turn for the larger firms, as shown in the table, was significantly higher than for the smaller firms; this condition is accounted for in part by the larger proportion of direct shipments handled by the large firms, but in the main probably reflects the use of more efficient policies and methods of merchandise control by the larger firms.

The generally better results obtained by the larger firms are also reflected in the higher average sales per employee for these firms, as may be seen from the following figures:

Volume of Sales	Average Sales Per Employee (Other Than Pipe Shop or Manufacturing Laborers)
All firms reporting	$20,000
Sales under $500,000	19,000
Sales $500,000 to $1,000,000	20,000
Sales over $1,000,000	22,500

Here's Automatic Regulation For Your Vacuumized One Pipe Steam Jobs



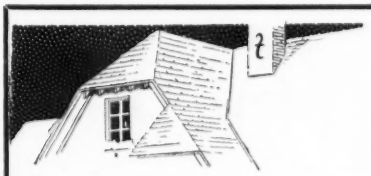
Just screw the old pressure regulator off, and screw this new vacuum-pressure regulator on.

That's all there is to it.

Get folder telling how to take this extra profit, with little labor cost to you.

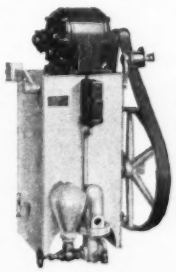
HUTCHISON Alternating Pressure-Vacuum DAMPER REGULATOR No. 60.

Hutchison Regulator Sales Corp.
12 Lispenard St. New York, N. Y.



New!

The Kewanee Small Deep Well Water System



Just what you have waited for. A small deep well outfit with capacities from 170 G. P. H. to 300 G. P. H. Differential plunger type—pumps air with water without separate air pump. Pumping unit enclosed—running in bath of oil. Motor driven and automatically controlled. Tension on pumping unit belt taken up by weighted belt idler. Write for catalog describing this and 200 other Kewanee Systems.

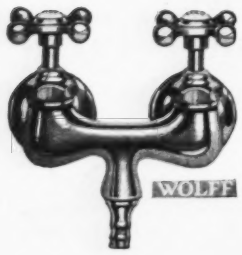
KEWANEE PRIVATE UTILITIES COMPANY
417 S. Franklin St. Kewanee, Ill.

KEWANEE

Manufacturers of water, light and sewage disposal systems

DEALER CORRESPONDENCE INVITED

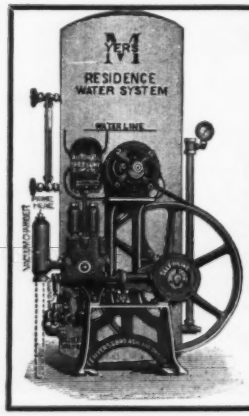
WOLFF



For your customers who demand beauty in the details of their homes "Duro" Brass Faucets in Nickel and "Durochrome" have a ready sales value. Their easy installation also affords you a larger margin of profit.

WOLFF CO.
"Superior Plumbing Fixtures"
CHICAGO

SUPERIOR PLUMBING FIXTURES



MYERS ELECTRIC HOUSE PUMPS
For Home or Farm

A complete unit ready to be connected up with water and power lines. Equipment includes pump, motor, tank, automatic switch, gauges, valves and fittings. Operation any electrical current—city service and farm lighting and power systems. Most important—safe, silent, sure and dependable. An acknowledged leader in water circles and one that always gives satisfaction. Other water systems of equal merit for hand or power operation make up the MYERS LINE—A postal brings catalog and information.

THE F. E. MYERS & BRO. CO.
Ashland, Ohio
Ashland Pump and Hay Tool Works

KEWANEE
RADIATORS

KEWANEE BOILER CORPORATION
Kewanee **Illinois**

The Hotstream
HEATS IN A HURRY
TRADE MARK REG
WATER-HEATER

KEROSENE HEATERS—WICK BURNER TYPE

Quadruple coils of copper and the patented Kerogas Burner (Hotstream is the only Water Heater licensed to use it) insure the greatest efficiency.

Lights instantly at the touch of a match—is noiseless, sootless and extremely economical.

Made in 3 sizes—write for complete information.

THE HOTSTREAM HEATER COMPANY
9502 Richmond Rd. *"Makers of Heaters that Heat"* **Cleveland, Ohio**

BEGIN OPERATING NEW MILLS

The tube mills of the British American Tube Division of the National Electric Products Corp. which have been under construction on tidewater at Bayway, N. J. (just outside of Elizabeth) are now completed and production of condenser tubes and brass pipe has begun. These mills replace those of the British American Metals Co., Inc., at Plainfield, N. J., which were destroyed by fire the early part of this year, preventing temporarily, the manufacture of the tubes and pipe. The new mills have been designed to handle a capacity from two to three times greater than the mills that were destroyed.

BILLINGS & SPENCER HAVE REORGANIZED

David J. Post becomes chairman of the board of The Billings & Spencer Co., Hartford, Conn., following the recent reorganization. Fred C. Billings is president and treasurer; A. H. Dante, vice president and general manager, and C. T. Smith, secretary and assistant treasurer. The officers and L. Edmund Zacher, R. J. Goodman, Nelson Smith, Edward Milligan and Lucius F. Robinson form the board of directors.

ESTABLISH OIL HEATING ENGINEERING SERVICE BUREAU

The S. T. Johnson Co., Oakland, Calif., has established an Oil Heating Engineering Service Bureau in that city. The purpose of this service is to assist architects, heating engineers and contractors in the solution of their more difficult oil heating problems.

From records compiled from operating data of thousands of oil burners under various conditions, may be obtained information on the cost of installation and operation of oil burning equipment, including rotary, low pressure air, steam atomizing and natural draft burners, as well as oil pumping and preheating equipment. Data may also be secured regarding approved and recommended vent or flue construction. In addition, wiring diagrams and blue prints of typical oil burner installations under various conditions may be obtained.

MADE DISTRIBUTORS FOR THREE LINES

The Besse-Hackett Sales Co., 2401 Chestnut street, Philadelphia, Pa., has recently been made distributor for the Milwaukee Flush Valve Co., Milwaukee, Wis., in Eastern Pennsylvania, Delaware and Southern New Jersey. The firm has also been given the lines of the J. P. Ward Foundry Co., Blossburg, Pa., and the Lansdale Nipple Co., Lansdale, Pa. The Besse-Hackett organization will represent the latter concerns in Pennsylvania, Delaware, Virginia, Maryland, District of Columbia, and Southern New Jersey.

MOVES BROOKLYN WAREHOUSE TO FOREST HILLS

The Central Foundry Co., New York City, recently announced that its warehouse which was formerly located in Brooklyn, N. Y., had been moved November 15 to Metropolitan avenue and Woodhaven boulevard, Forest Hills, L. I., N. Y.

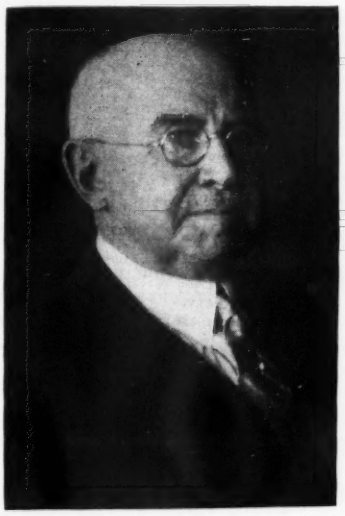
EDWARD A. MARSHALL CALLED BY DEATH

Edward A. Marshall, president of the Southern Supply Co., Baltimore, Md., died suddenly at his residence at Roslyn, Pikesville, Md., on Tuesday, November 13. Born sixty-four years ago, he came to this country from England, and became interested in the plumbing industry, with which he has been connected for thirty-five years. He first started working for the McShane Bell Foundry Co. In 1903 he took over the presidency of the Southern Supply Co., and saw this firm grow under his leadership from a small business. Always active to improve the trade.

and having taken the initiative in many of the forward steps of the plumbers and the wholesale dealers in Baltimore, Mr. Marshall's death will be keenly felt by the members of the trade, and by the various committees upon which he served.

J. B. MURPHY DIES IN CHICAGO

J. B. Murphy, vice president of the Kohler Co., Kohler, Wis., and for forty-five years a prominent figure in the plumbing industry, died November 12 in his home in Chicago after an illness that extended over a period of several months. His death brought to a close a colorful career which began in the early '80s and was replete with the romance that marks the last fifty years of industrial pioneering. He was born April 26, 1854, on his father's farm at Clyde, Wis. His father and mother had emigrated



J. B. Murphy

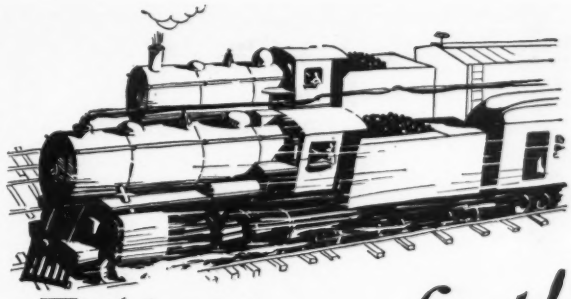
from Limerick, County Clare, Ireland, and as yet had been able to provide little more than the necessities of life. A boyhood spent on the farm instilled in Mr. Murphy a love of nature that often called him back to the country after his business interests took him to the city. He spent many days every year at his summer home at Lake Beulah, Wis.

It was not until after he had passed his twenty-ninth birthday anniversary that Mr. Murphy became identified with the plumbing industry, when he joined Crane Co. as a salesman. Within seven years he became a director of that company. In 1891 he was made secretary, and in 1902 he was appointed vice president and general manager. Later he severed his interests with the firm and spent a year traveling around the world.

January 1, 1908, Mr. Murphy joined the Kohler Co. As vice president, making his headquarters at Chicago, he played an important part in the development of the Kohler organization, with which his association remained unbroken until his death.

Mr. Murphy had been a resident of Chicago for more than fifty years. He had been a member of the Chicago Club since 1898, was a member of the Chicago Athletic Association for twenty-five years and was a life member of the Chicago Art Institute and a life member of the American Red Cross.

To his friends he was known as a master salesman in



5 times as fast!

A heavy laden freight train crawls along at 15 miles an hour while the limited races by at 75—5 times as fast!

A striking contrast, yet no greater than another contrast of vital importance to plumbing and heating contractors. Pressures in a closed system rise 5 times as fast as temperatures!

It will pay you to think of this rate of increase in terms of boiler explosions in closed domestic hot water supply systems. It only takes a temperature increase of 72° to 110° to effect a pressure increase of 60 lbs. to 265 lbs., and at 265 lbs. something is bound to give way mighty soon unless adequate relief be provided for.

Standard range boilers are guaranteed to be tight up to 85 lbs. working pressure. Extra heavy range boilers are guaranteed to be tight up to 150 lbs. working pressure.

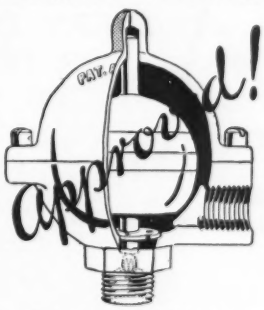
A Red Top Relief Valve (Model No. 1) is the simplest means of keeping a "closed" system "open" and of forestalling needless disaster and destruction. It is a positive acting device that protects your customers—and your own good will in the bargain.

A Red Top Relief Valve is approved by the Underwriters' Laboratories, Inc., America's foremost testing organization.

Pressure in the system automatically lifts a nickel-weighted piston—that's all there is to the operation of a Red Top. Gravity automatically closes the valve after adequate relief has been given.

In a Red Top Model No. 1 the lead ball is cast in four sections so that the valve can be set to relieve at 50, 75, 100 and 130 lbs., by adding or removing sections.

The Red Top Relief Valve Model No. 2 relieves at 30 lbs. and is used as the basis of an efficient and economical system of hot water heating. Find out more. Use the coupon.



Sectional View, Model No. 1 for domestic hot water supply systems

Neptune Meter Co.
50 E. 42nd St. New York City, N. Y.
Branch Offices in Principal Cities

Red Top Relief Valve

NEPTUNE METER CO.
50 East 42nd Street, New York, N. Y.
Please send me a copy of the new edition of your folder, "Protection," which describes Red Top Relief Valves and their operation.

Name.....
Street.....
City.....
State.....

IT PAYS TO BUY GOOD TOOLS

For Lower Threading Costs

Buy the New No. 11-A 1 to 2 in. Ratchet Beaver. The biggest improvement in die stocks in 20 years. All leading jobbers carry it in stock.

THE BORDEN COMPANY
510 Dana Ave., Warren, Ohio

BEAVER

TIME and LABOR SAVING TOOLS

Watrous

Patent Plumbing Fixtures and Duojet Water Closets

A LINE representing the most advanced ideas in sanitation. Economy of operation and ease of installation. Duojet Closets—Flush Valves—Self-Closing Basin Cocks—Combination Lavatory Fixtures—Pop-Up Wastes—Liquid Soap Fixtures, etc.

Manufactured and Sold Exclusively by

THE IMPERIAL BRASS MFG. COMPANY
1231 West Harrison St CHICAGO

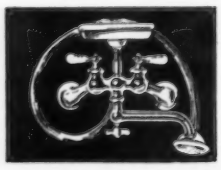
P PHOENIX
B BRASS
F FITTINGS

EVERY FITTING AIR TESTED UNDER WATER

P POPULAR
B BECAUSE
F FINER

Phoenix Brass Foundry
Irvington, New Jersey

Classic Sink Fixture



Father of all the other combination sink fixtures and far and away the biggest seller of the lot. You'll make no mistake to keep on selling Classics, no matter how many substitutes come hammering at your door.

CHICAGO FAUCETS

The Chicago Faucet Co.
2700-22 N. Crawford Ave
Chicago, Ill.

the fullest sense of the term, and in his business relations, as in his friendships, he was always honest and sincere. It is doubtful whether any man in the entire industry enjoyed greater popularity or had a wider acquaintance than Mr. Murphy. He was known as a perfect host, his doors were always open and he took delight in the many friends who visited him.

Funeral services were held November 13 in Chicago. Walter J. Kohler, president of the Kohler Co.; Herbert V. Kohler, executive vice president, and O. A. Kroos, secretary and treasurer, and John M. Kohler, Raymond W. Rensis and J. H. Swearingen, all members of the Kohler organization, served as pallbearers.

Flags were flown at half mast in Kohler Village from the time word of Mr. Murphy's passing was received until after the funeral. During the services the plant ceased operations for a period, and all members of the organization stood in silent tribute to the man who had risen from the ranks to a position of high responsibility in the business and industrial world.

NEW YORK JOBBERS HOLD ANNUAL FROLIC

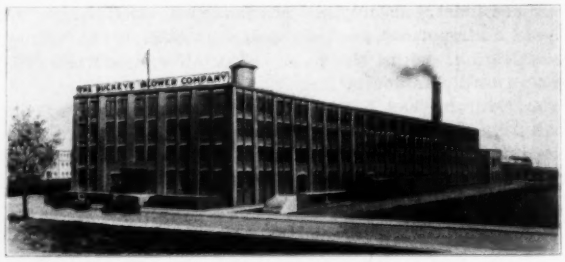
The Jobbers Credit Association of New York City climaxes its business season each year by a social event, which in its turn, is one of the finest functions of the social season. For four years this has taken the form of a dinner and dance, the fourth annual gathering being held at the Hotel Commodore on Saturday evening, November 10.

Like its predecessors, the function was an artistic and financial success. Its importance may be partially gauged by the fact that approximately 750 persons, wholesalers, manufacturers, salesmen, and their ladies, were present when the doors to the grand ballroom were opened and the festivities of the evening were begun. Numbers alone do not make for a successful party, but this large a crowd is the nucleus from which an interesting affair can be built.

The strains of the "Star Spangled Banner" started the festivities, and the 750 guests rose to their feet as one, then turned their attention to the first offering of what proved to be a delicious seven-course dinner. In between and during the courses the orchestra dispensed music that coaxed dancing couples to the floor.

A crowd of 750 naturally will include many celebrities. Leaders in all three branches of the industries were present, too many, in fact, to warrant their mention by name. However, other Metropolitan credit bureaus were represented by Elmer Doolittle, president of the Central Plumbing Supply Co., Portchester, who is head of the Jobbers Credit Association of Westchester County, Chester O. Ketcham, of Ketcham & Van Nostrand, Inc., Flushing, president of the Jobbers Credit Association of Long Island, and Henry D. Gasner, of Simon Gasner & Sons, Brooklyn, president of the Brooklyn Plumbing Supply division, Interchange Bureau, Inc.

The committee which had the party in charge included J. H. Ritchie, Crane Co., chairman, S. C. Breihof, Dimock



The new plant of the Buckeye Blower Co., Columbus, Ohio

Annual dinner dance of the New York Jobbers Credit Association

& Fink Co., Ernest E. Basch, Regent Plumbers Supply Co., Inc., Charles Schwartz, E. Schwartz Plumbing Supply Co., Mortimer Smolka, E. Smolka Plumbing Supply Co., J. A. Hurley, Pierce, Butler & Pierce Mfg. Corp., Israel Zicherman, Kamerman & Co., Inc., J. Weil, Weil Bros., Arthur Kramer, of Ben Kramer, C. W. Mitchell, W. H. Hussey & Son, Ralph Kaplan, Tremont Plumbers' Supplies, and H. C. Leavy, Sam S. Glauber, Inc.

Officers of the association include Milton M. Goldsmith, Samuel S. Glauber, Inc., president, Mr. Hurley, first vice president, Robert Bollman, Bollman Bros., Inc., second vice president, Mr. Breihof, third vice president, Edward Schwartz, E. Schwartz Plumbing Supply Co., treasurer, and Glenn B. Van Buren, secretary.

TO CONDUCT ANTHRACITE RESEARCH

The Frost Research Laboratory of Norristown, Pa., has been engaged by the Anthracite Operators Conference to conduct research on improved methods of using anthracite fuel in domestic heating. The scope of the work involves the investigation, testing and development of apparatus for the burning of anthracite, the removal of ashes and the control of temperature. Contact will be established with manufacturers of heating equipment, governmental bureaus and scientific and trade associations.

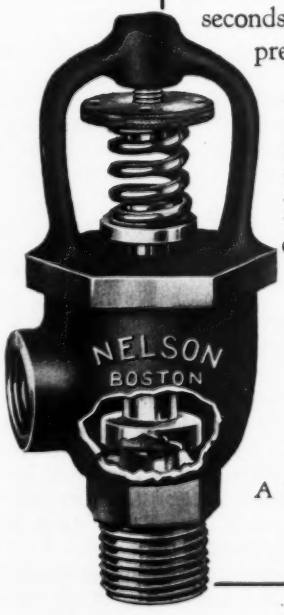
The conference, through the inauguration of this arrangement, seeks to stimulate an intensive development of automatic apparatus for efficient burning of anthracite, dustless removal of ashes and uniform combusion control.

Any mechanic can adjust the Nelson Relief Valve in ten seconds to take care of any pressure from 1# to 175#.

When the maximum pressure is reached you will hear a ***click.*** The Nelson Relief Valve operates automatically, drains just the right amount of water to reduce the pressure to within the proper bounds and then automatically closes.

A REAL RELIEF VALVE

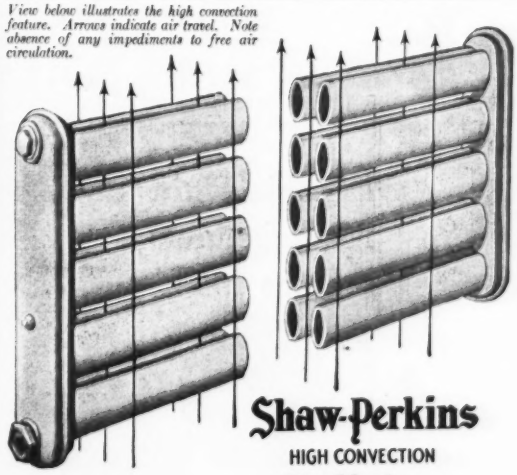
"Built with a click"



The STACK HEATER CO.

250 Stuart Street :: BOSTON, MASS.

View below illustrates the high convection feature. Arrows indicate air travel. Note absence of any impediments to free air circulation.



Shaw-Perkins
HIGH CONVECTION
Radiators

MADE in low, narrow, jointless units, as long as 14 feet, for steam and hot water heating, cooling, drying and industrial application.

Shaw-Perkins High Convection Radiators are light in weight, heat and cool quickly, save space, are absolutely sanitary, and are unusually adaptable. They represent an advanced design in Shaw-Perkins standard oval tube radiation, which contains original and valuable features found only in this distinctive type of heating surface. **Get the full story of this modern radiator. Send for catalog "D".**

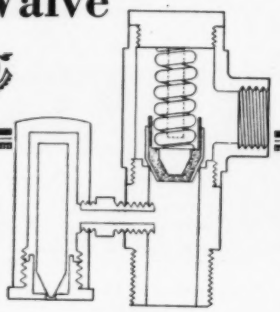
Shaw-Perkins Manufacturing Company
Pittsburgh, Pa.

DONNELLY

EDDY PRESSURE

Temperature and Vacuum

Relief Valve



You will find in the Eddy Pressure Temperature and Vacuum Relief Valve a long sought device, sensitive enough to give the most exacting response to heat conditions yet sturdy enough to last for years and be absolutely trouble free.

The Eddy Valve comes adjusted ready to use. It is easy to install.

Furnished also in separate form for Pressure Relief, Pressure and Vacuum and Temperature.

WRITE FOR DETAILS

DONNELLY MFG. COMPANY

29 Mills Street :: Malden, Mass.

Complete stock carried by N. Y. Representative,
HENRY STEIN, 50 Cliff St., New York City

FLAGG

Malleable Fittings
Manufacturers
Since 1854

EXTRA HEAVY

The Number of Flagg Fittings that are on the job doing the work they are intended to do, in the manner it should be done, is the best witness of Flagg Fitting dependability. ASK THE OLD TIMERS—they know.

STANLEY G. FLAGG & COMPANY, INC.
1421 CHESTNUT ST., PHILADELPHIA, PENNA.

Personal Mention

R. T. Crane, Jr., president of Crane Co., Chicago, recently donated over 50 acres of land near Ottawa, Ill., to the State of Illinois for a public park, to be known as Buffalo Rock Park. The deed was turned over to the state on Thursday, November 15.

W. E. Sloan, president of the Sloan Valve Co., Chicago, is at Miami Beach, Fla., where he will stay for a few weeks' vacation.

William E. Clow, Sr., president of James B. Clow & Sons, Chicago, left November 14 for the north woods for his fiftieth deer hunting season in that locality. He was accompanied by a party of nine, most of whom have been included in his hunting trips for the past thirty years. Among those on the trip were William E. Clow, Jr., and Kent S. Clow, both of the Clow company.

Rudolph B. Flershem of Buffalo, N. Y., chairman of the executive committee of the National Radiator Corp., Johnstown, Pa., has been made vice chairman of the University of Buffalo's second endowment fund campaign.

Frank A. Webb

Frank A. Webb, formerly president of the Acme Frost Proof Closet Co., Baltimore, Md., has recently severed his connection with that company and is now a special representative of the "I-X-L" Pump & Mfg. Co., Philadelphia, Pa. Mr. Webb was for many years with the Jos. A. Vogel Co., Wilmington, Del., and most of his business experience has been in the frost-proof closet field. At present he is working through the South to meet **H. W. Powell** of Chattanooga, Tenn., Southern representative of the "I-X-L" Pump & Mfg. Co.

Erwin W. Felt, formerly assistant manager of the New York City branch of the American Radiator Co., has been appointed manager of the Paterson, N. J., branch of the same company. The new warehouse, located near Paterson, was recently opened by the boiler and radiator manufacturers. Offices are located at 301 Main street, Radburn, N. J.

Robert D. Yankey, of the Rollin C. Wilson organization, has established headquarters at 13 North avenue, East, Cranford, N. J., as a more central location from which to cover his enlarged field, due to the addition of the state of New Jersey and western New York State to his present territory, which included Pennsylvania, Delaware, Maryland, District of Columbia and Virginia.

J. J. Gannon, eastern representative for the A. Y. McDonald Mfg. Co., Dubuque, Iowa, has been confined in the Knickerbocker hospital, New York City, where he is recovering from a major operation.

Thomas E. Follett, manager of the Portland, Ore., office of M. Stulsaft Co., has returned from a trip down the Willamette Valley as far south as Ashland.

James R. Gilmour, well known to the trade throughout New Jersey, has joined the sales staff of the Victor Brass Mfg. Co., Cleveland, Ohio. He will cover New Jersey territory. For some time Mr. Gilmour has been a member of the sales force of the H. M. Flemming Co., New York City.

Heating a British Cathedral

(Continued from Page 22)

poses, when cold weather makes it necessary to warm it.

The warm air ducts and channels are covered with slate slabs 1¼ inches thick, on the top of which, bedded in cement, is the marble which forms the floor proper, and as this is really a large radiator having a temperature of about 70 degrees F., the congregation do not experience the discomfort due to cold feet.

The Human Element in the Regulation of Temperature

No thermometers or other apparatus for regulating temperature are used in connection with the stoves that heat the air. Each stove holds about five cwt. of fuel (coke) in its fire-pot. The stoking is done by hand, by the engineer-stoker, and the even temperature of the air in the interior of the cathedral gives unquestionable evidence of his skilful management of the fires; he informed the writer that he found no difficulty in controlling the fires so that an even temperature was maintained in any kind of weather, he also stated that an air temperature of more than 60 degrees was not desirable because of its injurious effects upon the organ.

The hot-air stoves are set entirely in brickwork which is quite independent of the structure of the cathedral; this will enable old stoves to be replaced by new ones quite easily.

The Hot Water Heating Apparatus

Wrought iron pipes are used for the four-inch flow and return mains which circulate hot water from the boilers to those separate parts of the cathedral which are warmed by ordinary radiators. The Chapter House, which was given by the Freemasons of Liverpool, is warmed by two batteries of concealed radiators; air passes under the oak seats, it then ascends through the radiators and is discharged through ornamental openings situated fourteen feet above the floor, in the walls.

In the Lady Chapel there are twenty-nine large radiators all situated at a lower level than the hot water boilers and at a considerable distance from them; but a perfectly satisfactory circulation is obtained by means of an electrically driven circulating pump, which is connected to the 4-inch return main near the boilers.

The ambulatory, vestries, and the under croft, are also warmed by means of radiators.

During the winter months the cathedral is satisfactorily warmed with a fuel consumption of from eight to ten tons of coke per week, and even in very severe weather, that amount is not greatly exceeded; about twenty tons per week will be the quantity needed when the remaining portions of the cathedral are built and in use.

Protection Against Fire

A concrete reservoir, lined with asphalt, and holding 20,000 imperial gallons of water, is situated near the heating chamber.

The reservoir is fed by a 6-inch main, from the city water supply, and another 6-inch main serves the hydrants which are situated in various parts of the cathedral. Owing to the height of the building, a powerful, electrically driven, centrifugal pump, capable of discharging 600 imperial gallons per minute is connected to the 6-inch delivery main, 4-inch branches from which serve each hydrant. The pump can be started by means of an electric connection from each hydrant box, and it is brought into use at certain periods so as to insure that it is in proper working order.

The Roof Covering and the Rain Water Leaders

The roofs are covered with sheet copper. In some cases the sheets are welted together; but in others, where the pitch is less, methods giving greater security against

Every plumbing contractor is a purchasing agent

Fig. 715
Jenkins Bronze Fire Line Angle Valve

Fig. 352
Screwed, Jenkins Standard Bronze Swing Check Valve

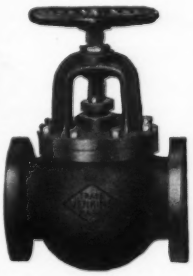


Fig. 142
Screwed, Jenkins Standard Iron Body Globe Valve

Every plumbing and heating contractor is a purchasing agent for his customers. Whether he realizes this or not, his customers are sure to do so, and many look upon him as an equipment counselor to be held to strict account for what he installs.

When it comes to valves it pays to do your work full justice by using Jenkins. An all-Jenkins job is a trouble-proof job — one that is bound to create a lasting favorable opinion of your work.

To many of your customers, the name and trade mark of Jenkins Bros. are sure to be already known—symbols of a valve made for the maximum service, not merely the average. To these people, the use of such quality - first equipment does much to create a common bond of confidence, like an introduction from a mutual friend.

Let Jenkins performance and the Jenkins 60-year reputation combine to win for your work that all-important consideration — favorable word - of - mouth publicity.

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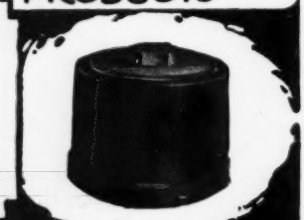
Trap Screw FERRULES

Richmond Trap Screw Ferrules are clean cut, uniform and perfectly machined. They are the result of long years of manufacturing experience in the plumbing specialties field.



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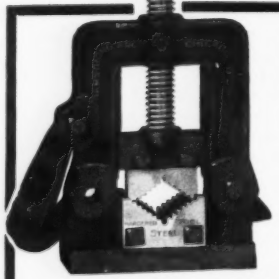

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Correctly designed and accurately made of the finest materials, these vises will give long and satisfactory service.

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Build your reputation on LEAD *—the dependable metal.*

EAGLE-PICHER

a driving rain have been adopted. In all cases, however, the work is made watertight without soldering.

The rain water heads and rain water leaders are all made of cast sheet lead. The rain water leaders are of rectangular shape, have ornamental sockets suitable for the type of building on which they are fixed, and are made in 6 feet lengths. Each length was shaped upon a solid wooden model. The two edges of the lead are joined together by lead burning, the seam being kept at the back of the pipe so as to be out of sight.

Some Interesting Particulars

The work in connection with the foundations was commenced in January, 1905. Excavations were carried to a depth of 54 feet in some cases before the solid rock was reached.

The huge solid concrete foundation pillars are 45 feet square at the base tapering to 25 feet square at the level where the brickwork foundations started. In no case was work upon the concrete foundations begun until the solid rock had been reached.

To complete the foundations of that portion of the cathedral that is already finished, 70,000 tons of earth had to be excavated and removed, and 26,000 tons of cement concrete had to be placed in position. Nearly two millions of bricks were used together with 6,000 cubic feet of stone; this work was completed in sixteen months, the number of workmen employed being about 300 per week.

Nearly one million cubic feet of Woolton red stone have been used in the construction of that part of the cathedral which is now being used for religious services; this stone, which is of warm and cheerful appearance, is obtained locally from Woolton Quarries which are situated about five miles from the cathedral.

In addition to the stonework, over 6½ millions of bricks, and 2,650 tons of cement have been used in the structure above the foundations.

On the roofs, 31 tons of sheet copper have been used.

Cleanliness is next to godliness, and the hygienic side of matters has not been overlooked; this will be evident from the fact that special means have been provided for the cleansing of the kneeling cushions, by means of vacuum cleaners.

In connection with the foregoing quantities, it should be remembered that little more than one-third of the cathedral has been completed.

Dimensions of the Entire Cathedral, When Finished

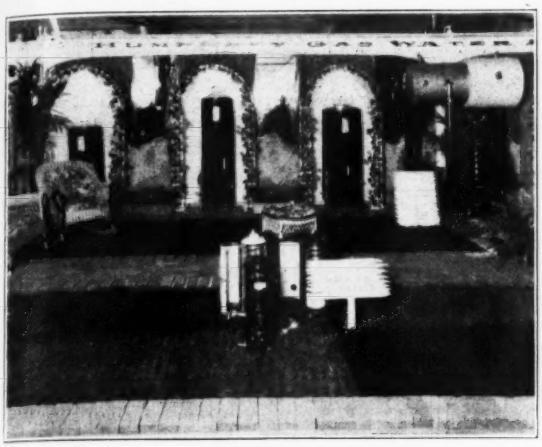
Total over-all, exterior, length.....619 ft.
Height of Central Tower above floor level.....308 ft.
Height of main roof .....138 ft.

The system installed for the warming of Liverpool cathedral undoubtedly merits the full consideration of heating engineers throughout the world; it is really the adoption of a huge continuous radiating surface which

Comparison with Other Leading Cathedrals of the World

	Area in sq. ft.	Height of tower or dome in ft.	Interior height in ft	Exterior length in ft.
St. Peter's, Rome	227,069	448	150	718
Liverpool	100,000	308	116 and 173	619
New York	109,082	500	130	601
Milan	107,000	335	153	500
Seville	128,570	400	150	430
York Minster, England	63,800	198	99	486
St. Paul's, London	59,700	363	89	460

throws off long-wave dull radiant heat at an unusually low temperature which is favorable to a satisfactory relative humidity of the internal atmosphere. Naturally the cathedral authorities and the heating engineers are proud of the results that have been achieved. But, carrying greater weight, are the opinions of foreign visitors that



Part of the exhibit of the Humphrey Co. at the convention of the American Gas Association held recently at Atlantic City

have attended services in the cathedral during the winter months. Many of these visitors have stated that in no other building anywhere have they experienced the same pleasant feeling of agreeable warmth and freshness which is also free entirely from the oppressive stuffiness that so often has to be endured in buildings of this kind.

THIS WAS NEWS 1908 20 YEARS AGO

November 21, 1908

The Standard Sanitary Mfg. Co., of Pittsburgh, Pa., has taken out a charter in Maine, under which it will handle its business in New England. The new subordinate company will have its headquarters in Boston in connection with the parent company's warehouse at 37 Lewis wharf.

———1908———

Arthur C. Walworth, of the Walworth Manufacturing Co. of Boston, gave a dinner last Wednesday, November 18, at the Exchange Club in that city in honor of the one hundredth anniversary of the birth of his father, James J. Walworth, a pioneer in the steam heating and piping business in this country. He passed away on April 28, 1896, in his 88th year.

———1908———

The Chicago North and West Side Master Plumbers' Pleasure Club will hold its fifth annual ball and reception at the Northwest Hall, 690 West North avenue, on Wednesday evening, December 16.

———1908———

Weston M. Fulton of Knoxville, Tenn., has received patent on a flexible wall for a steam valve.

———1908———

Brownell-Mason Co., of 159 Main street, Fitchburg, Mass., has the contracts for the plumbing and heating in several new residences in Fitchburg, Mass.

———1908———

The principal articles in this issue were devoted to descriptions of public comfort stations in many cities. Numerous illustrations and plans of comfort stations in Scotland, England, France, New York City, Cleveland, Worcester, Cincinnati, Washington, etc., were published.

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Paragon SELF-CLOSING FAUCETS
with renewable seats
Fig D213A Patented
SMOOTH ball-bearing action. Patented "Samson" Lock, which makes Paragon handles easiest to adjust without special tools. Longer wear — better action. A wide variety of bodies and handles. Write for folder on the complete line.
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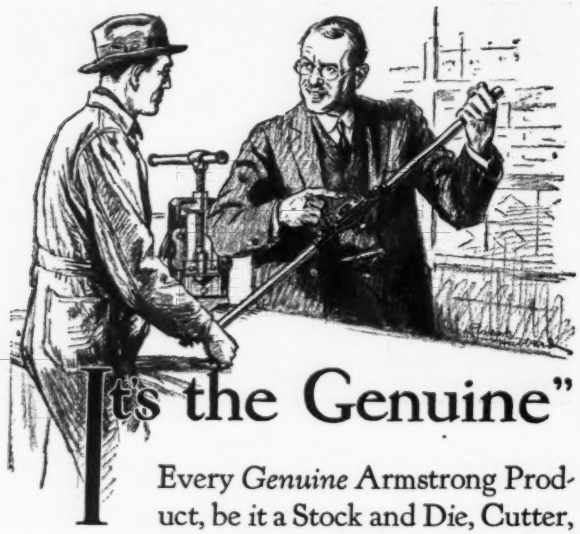
The CENTRAL BRASS Mfg. Co.
PARAGON DIVISION CLEVELAND O.

The FAMOUS Sylphon TRADE MARK BELLOWS
Original — Genuine
Sylphon Temperature Regulators, Pressure Regulators and Expansion Joints are in almost universal use, in thousands of buildings, in nearly all industrial plants, in great power plants, and in the homes of the people.
The Fulton Sylphon Company, Desk K Knoxville, Tenn., U. S. A.

SANI-TEED PLUMBING PRODUCTS
PALMER Improved
Sewer Gas and Backwater Trap
The setting of this trap is extra heavy but can be used with standard pipe. Its hand-ground seat makes it absolutely tight against backwater pressure but a FULL flow area is allowed at all times for the normal flow of water.
Write for details.
J. A. ZURN MFG. CO., ERIE, PA.



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GOOD NEWS! We are now manufacturing a complete line of GENUINE ARMSTRONG DIES for BRASS PIPE *only*. A special booklet giving valuable information on the threading of BRASS PIPE and interesting facts about GENUINE ARMSTRONG BRASS PIPE DIES will be sent *free of charge* upon request.

Vapor Heating Systems

(Continued from Page 39)

A dimension diagram of the trap (Fig. 8) is given in Fig. 10 and the dimensions are covered in Table 7.

In the diaphragm trap, a diaphragm is substituted in

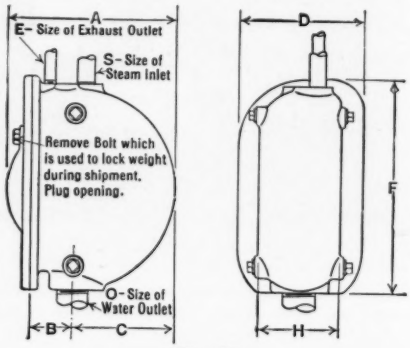


Fig. 17

place of the bellows and, of course, the trap body is modified in shape so as to accommodate the diaphragm. A

Table 8

Dimensions of Diaphragm Traps, Angle Type

Size of Trap Inches	No. of Trap	Dimensions A Inches	B Inches	C Inches	D Inches
½	712	3¼	1⅞	1⅜	3
½	722	3½	1⅞	1⅞	3⅜
¾	723	3¾	1⅞	1⅞	3¼
¾	733	4½	1⅞	2¼	4⅜
¾	713	3¾	1⅞	1⅝	3⅛
1	744	4¾	2	2⅛	4⅛
1¼	745	4¾	2	2⅛	4⅛

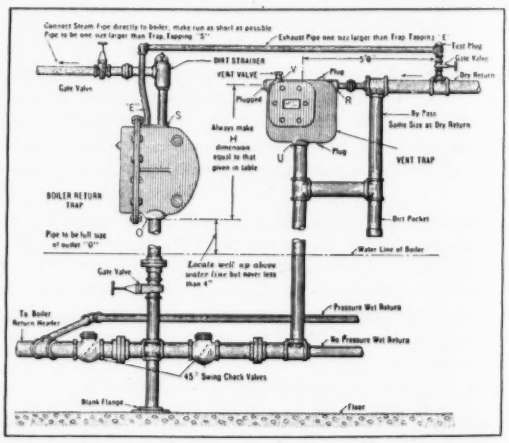

Connect Steam Pipe directly to boiler, make run as short as possible
Exhaust Pipe one size larger than Trap Tapping "E"
Test Plug
Gate Valve
Dry Return
DIRT STRAINER
VENT VALVE
Plug
Gate Valve
Plugged
By Pass Same Size as Dry Return
Always make H dimension equal to that given in table
Plug
VENT TRAP
BOILER RETURN TRAP
Dirt Pocket
Pipe to be full size of outlet "O"
Water Line of Boiler
Locate well up above water line but never less than 4"
Gate Valve
To Boiler Return Header
Pressure Wet Return
No Pressure Wet Return
45° Swing Check Valves
Blank Flange
Floor

Fig. 18.—Conventional arrangement of piping around boiler return trap

Table 9

Ratings of Radiator Traps

Residences (Small Buildings) Sq. Ft.	Size Inches	No.	Apts., Schools, Churches (Larger than Residences) Sq. Ft.	Size Inches	No.
0 to 75	½	512	0 to 105	½	512
75 to 125	½	522	105 to 175	½	522
125 to 375	¾	533	175 to 530	¾	533

dimension diagram for the diaphragm return trap is shown in Fig. 11. The dimensions are quoted in Table 8, and the ratings in Table 9.

The drip trap, Fig. 22 and Fig. 23, includes a float-operated valve for the discharge of water and a diaphragm thermostatic disc and valve for the discharge of air. An

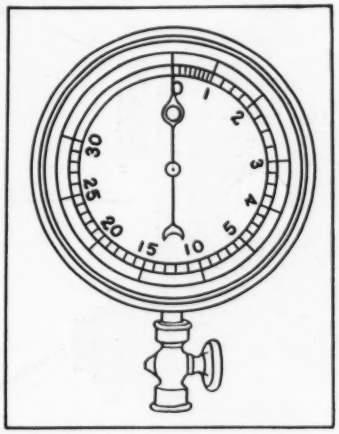


Fig. 19

Table 10

Sizes of Dirt Pockets

Symbol	Sizes								
	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	J Inches
526.....	1¼	1	1	¾	1¾	1⅜	1⅞	1	6⅞
826.....	2	1¼	1¼	1	2⅛	1⅝	2⅝	1½	7⅞
1026.....	2½	1¾	1½	1¼	2⅝	1¾	2¾	1⅝	9¼
1226.....	3	1¼	1½	1¼	2¾	1¾	3⅛	1⅞	10⅝

outlet in the top allows the air to discharge to the dry return. There is also a bottom outlet and side outlet and two inlets one on each side of trap.

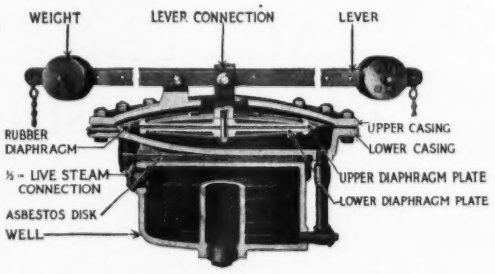


Fig. 20.—Section of damper regulator

Table 11

Dimensions and Tappings of Air Vent Traps

Size of Air Vent Trap	Dimensions						Tappings		
	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	R Inches	U Inches	V Inches
0023.....	4⅛	7	3½	6½	4⅛	....	1	1s	½
023.....	6⅞	13	6¾	11¼	9⅜	4⅞	1	2s	½
123.....	9¼	17⅜	8	17⅛	14⅞	5½	1¼	2½s	1¼
223.....	9¼	17⅜	8	17	14¾	5½	1¼	3f	1¼
323.....	9¼	17⅜	8	17	14¾	5½	1¼	3½f	1¼

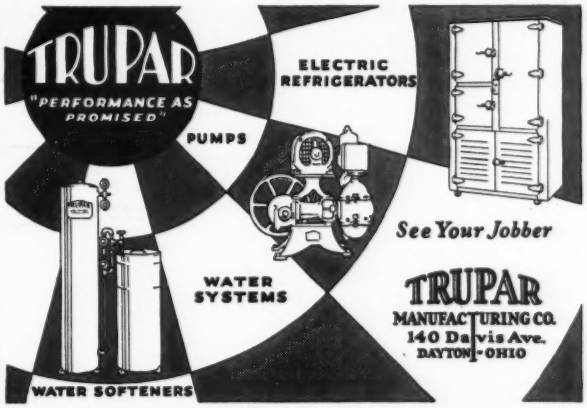
Note "s"=screwed and "f"= flanged.

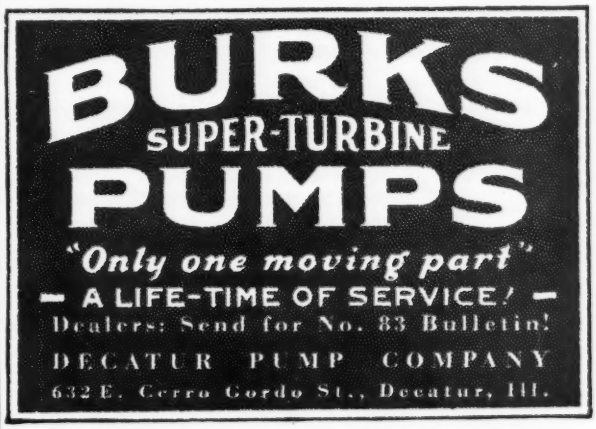
Fig. 21

The dirt pockets, Fig. 24, are one piece castings provided with a baffle on the inside which makes them very efficient. They are made in four sizes as shown in Table 10 (Fig. 25).

The Vent Trap

In construction the vent trap consists of a cast iron container on top of which is lo-





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cated a light weight seamless ball which operates inside of a cage-like cap as shown in Fig. 12, so as to allow a free vertical movement and a seating on a sharp-edged seat. A combination of ball float and levers also is arranged inside of the trap so as to close off the vent outlet whenever water rises into the air vent trap.

Figs. 13 and 14 give dimension diagrams for the vent traps all sizes except 0023 being as shown in Fig. 13 and size 0023 being as given in Fig. 14. Dimensions for the air traps will be found in Table 11.

The Boiler Return Trap

The boiler return trap interior is pictured in Fig. 15, the mechanism being held in place by the stud bolts marked "AA" and rotating on the monel metal pin "B." The float and counterweights are so balanced that the steam valve (which is not indicated in the cut) is opened when the water reaches the high level. A dimension diagram for all sizes of the boiler return traps except the 0023 is given in Fig. 16 and for the 0023 size in Fig. 17. Dimensions and tappings will be found in Table 12.

The Dirt Strainers

These dirt strainers are always used in connection with boiler return traps and are placed in the connections to the boiler header, shown in Fig. 21 and Fig. 26, while the dimensions are covered in Table 13 on the opposite page.

Settings for Boiler Return Traps and Air Vents

Certain relations between the boiler return trap, the vent trap and the boiler water line must be kept in mind.

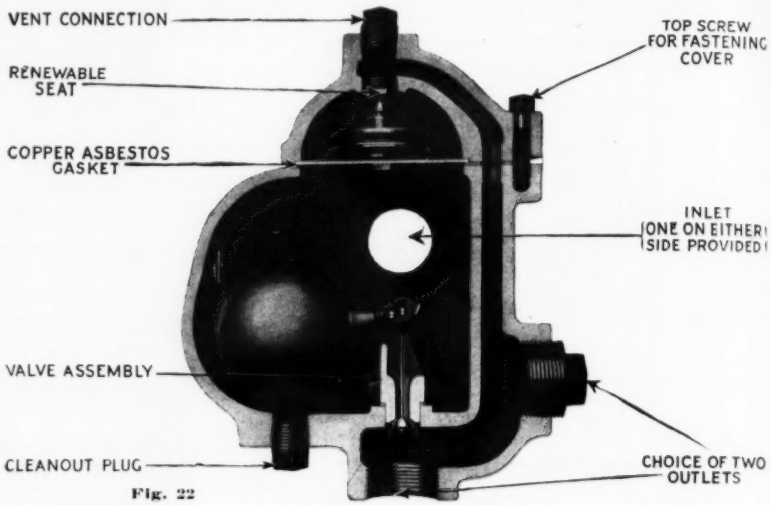
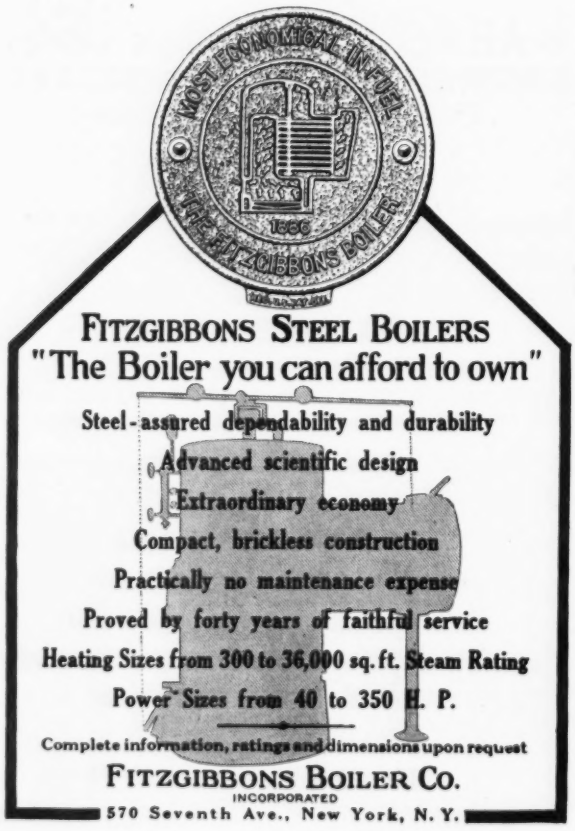


Fig. 22

Table 12
Dimensions and Tappings for Boiler Return Traps

Size of Boiler Return Trap	Rating Sq. Ft.	Dimensions A Inches	B Inches	C Inches	D Inches	F Inches	H Inches	E Inches	Tappings O Inches	S Inches
0023	1500	10¼	2⅝	6	7½	12¾	5	½	1½	¾
023	2500	13½	2	7⅞	8⅞	16¼	6½	½	2	1¼
123	4000	15⅝	3⅝	8¼	8¼	18¼	7½	½	2½	1¼
223	8000	22⅝	9	10¾	12¼	23½	9⅝	¾	3	1½
323	16000	22⅝	9	10⅜	15⅝	23½	12¼	¾	3½	1½



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JOHN W. STILES & SON, 700 Prospect-Fourth Bldg., Cleveland, Ohio
W. F. HARPER, 3733 Lindell Blvd., St. Louis, Mo.

Table 13
Size and Dimensions of Dirt Strainers

Symbol	Size	Used with Boiler Return Trap	Dimensions A	A'	B	B'	C	D	F
	Inches		Inches	Inches	Inches	Inches	Inches	Inches	Inches
024	1 x ¾	0023	1	¾	3	1¾	6⅜	3¼	2½
124	1½x1¼	023 & 123	1½	1¼	3⅞	2¼	8	4	3¼
224	2 x1½	223 & 323	2	1½	4⅞	2¾	9½	5¼	4¼

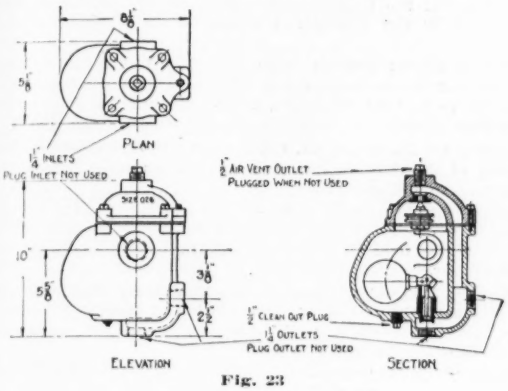


Fig. 23

These are illustrated in Fig. 18, in which a conventional arrangement of piping for a typical hook-up is shown.

Fig. 24

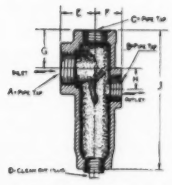
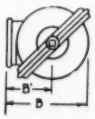


Fig. 25

The dimension "H" should be 14¼ inches for the 0023 size, 16¾ inches for the 023, 18¾ inches for the 123, 23 inches for the 223 and 26¾ inches for the 323 traps. Also note that the bottom of the boiler return trap should be as high as possible above the water line of the boiler but never less than 4 inches, while on the 0023 size it must be not less than 5 inches.



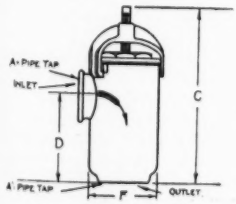


Fig. 26

A Description of the Boiler Accessories

On the boiler, the compound vacuum and pressure gauge is used, this being illustrated in Fig. 19 shown on page 77 and a sensitive damper regulator which is shown in Fig. 20 (See page 77).

Copper Production Increases

Production of copper by countries which furnish about 98 per cent of the world's total was 173,628 short tons in October, against 154,518 tons in September and 145,278 in October, 1927, according to the American Bureau of Metal Statistics.

RAYMOND
LEAD ROOF
FLANGES

No caulking is necessary when you use Raymond Lead Roof Flanges. They are easiest to install and will last for the life of the roof without loosening or leaking.

Lead Pipe, Sheet Lead, Lead Traps

DUTCH BOY PRODUCTS
HOYT METAL PRODUCTS
RAYMOND LEAD PRODUCTS

NATIONAL LEAD COMPANY
900 W. Eighteenth Street CHICAGO

Tank Fittings of Quality

1856 "McSHANE" 1928

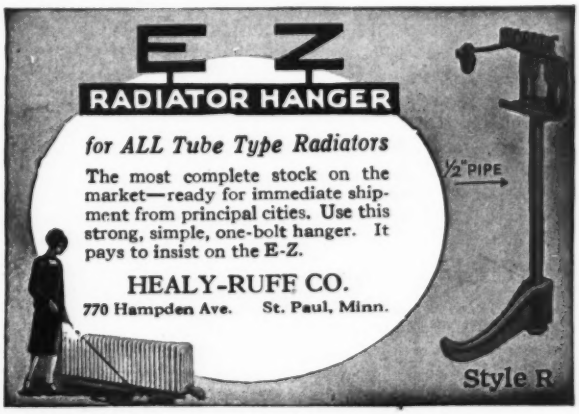
The ORIGINAL Compound Lever Ball Cock. Elevated, Low-Down, Top and Bottom Supply Tank Levers and Valves.

McSHANE BELL FOUNDRY CO.
Baltimore, Maryland

E Z
RADIATOR HANGER
for ALL Tube Type Radiators

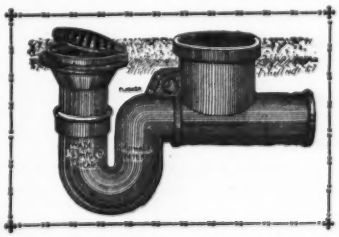
The most complete stock on the market—ready for immediate shipment from principal cities. Use this strong, simple, one-bolt hanger. It pays to insist on the E-Z.

HEALY-RUFF CO.
770 Hampden Ave. St. Paul, Minn.



You can install this Wade Combination in the ground at any depth and extend upward to any floor level by the use of manhole cleanout extensions.

Ask your jobber about this and other Wade drainage fittings and valves



WADE IRON SANITARY MFG. CO.

551-553 West Fulton St., Chicago, Ill.

GRADUAL, THERMOSTATIC DRAFT CONTROL *for* Hot Water Boilers

Gradual draft control is as practical on hot water boilers as on steam, vapor and vacuum systems, provided the regulator is sensitive enough and powerful enough to transmit slight changes of water temperature into action on the draft and check dampers.

The National METAPHRAM Type "F" Damper Regulator does this—without the aid of room thermostats, electrical connections, motors, or other mechanical complications. It is a simple, self-contained thermostatic device, easily and quickly installed in the boiler shell or flow line, working directly from changes in water temperature.

NATIONAL

National Systems of Heat Regulation and Humidity Control, Metaphram Dampers, Metaphram Motors, Industrial Thermostatic Devices, A-Jacks Steam Damper Regulator for high pressure boilers, Metaphram Damper Regulators for domestic steam, vapor, vacuum and hot water heating boilers, Metaphram Furnace Regulators.

METAPHRAM

It is a sensible, practical application of thermostatic control working directly on the heat source.

Sign the coupon, or write us today, for all the details.

NATIONAL REGULATOR CO.
2317 Knox Avenue Chicago, Ill.

NATIONAL REGULATOR CO., 2317 Knox Ave., Chicago.
Send us complete information on METAPHRAM Type "F" Damper Regulator.

Name.....

Address.....

Town..... State.....

My jobber is.....

Convention Dates

December 3-8, 1928.—POWER EXPOSITION—The seventh annual National Exposition of Power and Mechanical Engineering, to be held at Grand Central Palace, New York City.

January 14, 15 and 16, 1929.—PRESIDENTS AND SECRETARIES—The seventh annual Presidents' and Secretaries' Conference of the Plumbing and Heating Industries Bureau, to be held in the Florentine Room of the Congress Hotel, Chicago.

January 22, 23 and 24, 1929.—ILLINOIS—The thirty-seventh annual convention of the Illinois Master Plumbers Association, to be held at Peoria, with headquarters at the Pere Marquette Hotel.

January 28, 29, 30 and 31, 1929.—A. S. H. V. E.—The annual meeting of the American Society of Heating and Ventilating Engineers, at Chicago, Ill.

January 29, 30 and 31, 1929.—WISCONSIN—The thirty-fifth annual convention of the Wisconsin Master Plumbers' Association, to be held in Milwaukee, with headquarters at the Hotel Pfister.

February 5, 6 and 7, 1929.—OHIO—The thirty-eighth annual convention of the Ohio State Association of Master Plumbers, to be held in Mansfield, with headquarters at the Mansfield-Leland Hotel.

February 12-16, 1929.—POWER SHOW—The fourth annual Midwest Power Engineering Conference and Exposition, to be held at the Coliseum, Chicago.

March 11, 12 and 13, 1929.—INDIANA—The thirty-third annual convention of the Indiana Society of Sanitary Engineers, to be held at South Bend.

March 11, 12 and 13, 1929.—VIRGINIA—The sixth annual convention and a two-day institute of the Virginia Associated Plumbing and Heating Contractors, to be held at Charlottesville.

March 25 and 26, 1929.—MISSOURI—The forty-fifth annual convention of the Missouri State Association of Master Plumbers, to be held in Springfield.

April 2, 3 and 4, 1929.—A. O. B. A.—The annual convention of the American Oil Burner Association, to be held at New York City.

April 25 and 26, 1929.—LA.-MISS.—The eighth annual convention of the Louisiana-Mississippi Association of Plumbing and Heating Dealers to be held at Gulfport, Miss., with headquarters at the Markham Hotel.

May 6 and 7, 1929.—FLORIDA—The seventh annual convention of the Florida State Association of Master Plumbers and Heating Dealers, Inc., to be held at Daytona Beach.

May 23, 24 and 25, 1929.—N. A. P. H. S.—The fourth annual convention of the National Association of Plumbing and Heating Salesmen, to be held at Philadelphia.

June 25, 26 and 27, 1929.—N. A. M. P.—The forty-seventh annual convention of the National Association of Master Plumbers, to be held at Buffalo, N. Y., with headquarters at the Hotel Statler.

COMING TRADE EVENTS

November 12-26, 1928.—The first annual short course for plumbing instructors, to be held at the Agricultural and Mechanical College of Texas, College Station, Tex.

November 24, 1928.—A dinner dance to be given by the Ladies' Auxiliary of the Heating and Piping Contractors Milwaukee Association at the Elks Club.

November 27, 1928.—A dance to be given by the Women's Auxiliary to the Milwaukee Master Plumbers Association for families of master plumbers, to be held at Colonial Hall.

December 12, 1928.—The open meeting of the Bronx branch, Association of Master Plumbers of the City of New York, to be held at the Bronx Masonic Temple, 1931 Washington avenue.

The Craymer & Watts Plumbing Co., Baling, Tex., is nearing the end of a contract for 116 four and five-room cottages for the Texas Gulf Sulphur Co. on its new town site known as New Gulf.

B. Y. Kinzey, executive secretary of the Virginia Associated Plumbing and Heating Contractors, addressed the annual convention of the Virginia Real Estate Association at Roanoke recently.

THE TRADE

NEWS FOR PLUMBING AND HEATING CONTRACTORS

N. A. M. P. ISSUES CONVENTION PROCEEDINGS

The proceedings of the forty-sixth annual convention of the National Association of Master Plumbers, held in Memphis, Tenn., June 19, 20 and 21, 1928, have recently been sent to members of that organization. Aside from the actual proceedings of the convention, the booklet contains a list of the officers, directors and committees for 1927-8, and also pictures of Jere Sheehan, Jr., newly elected president, and Ed. L. Penfrase, newly appointed secretary. The booklet also contains the constitution and by-laws of the organization.

PLAN NEWSPAPER ADVERTISING IN BALTIMORE

A meeting of the board of directors of the Master Plumbers Association of the State of Maryland and of a committee of the wholesale plumbing supply companies was held on November 15, at the Merchants Club, where luncheon was served and the contemplated advertising campaign in Baltimore was discussed. An extensive advertising campaign, which it is believed will be extended over a period of a year, is to be inaugurated. Newspaper advertising is to be concentrated upon, followed by direct advertising of the individual members. In reference to this, H. A. Gillespie of the Central Metal & Supply Co., read a letter from William G. Bergner, secretary of the Plumbing and Heating Industries Bureau, outlining some methods to be pursued, and offering suggestions. It was finally decided that the newspapers would be the best channel by which to reach most of the people.

Allen W. Beam, of the master plumbers association, told how anxious the members were to get things started, and how every effort on the part of the association would be put forward to make a success of the proposition. The question of advertising a partial payment plan, to be used by the plumbers in conjunction with the other ideas, produced quite a discussion. Nothing definite as to this was decided, so that it will be settled at the next meeting.

A special committee was appointed to obtain data on the cost of advertising and also as to the advisability of the employment of a publicity man to direct the campaign. The following were selected: J. J. Springer and H. A. Gillespie, representing the wholesalers, and Wm. F. Mylander, representing the master plumbers.

Those who attended the meeting were: J. J. Springer of Crane Co., H. A. Gillespie of the J. Robertson Mfg. Co., W. J. Kraus of the Kraus Sanitary Co., J. W. Monosmith, president of the Master Plumbers' Association, A. W. Beam, A. V. Eidman, William F. Mylander, Francis C. Dorsey, S. E. Houck, all being members of the board of directors of the association, and J. W. Clark, executive secretary of the association.

MAKE PLANS FOR NEW YORK INSTITUTE

Leaders of the New York State Association of Master Plumbers and officials of New York University are making plans for the second Plumbing Institute, which will be held at the New York City institution early in 1929. Stephen H. Welch, of the Bronx, past president of the masters' body, who was in charge of the arrangements in 1928, has again been selected as chairman, and a committee is being built up to assist him. Members of the committee are being selected from various cities over the state, so that information about the institute can be widely disseminated.

Pueblo, Colo., Has New Plumbing Showroom

THE progress of an industry can usually be measured by the activities of its members. On the left we have a photograph of the new plumbing and heating establishment of the Stephan-Balfe Plumbing & Heating Co., Pueblo, Colo. The display was opened recently by the company in its own building, and characterizes the movement on the part of retailers toward merchandising the industry's products, thereby showing its progress.

ENGINEERING STANDARDS COMMITTEE TAKES ASSOCIATION FORM

Unanimous approval by the 37 member bodies of the establishment of the American Standards Association to succeed the American Engineering Standards Committee, is announced by William J. Serrill, assistant general manager of the United Gas Improvement Co. of Philadelphia. Mr. Serrill was chairman of the Standards Committee and now becomes president of the American Standards Association. One of the most important results of the abandonment of the committee form of organization will, according to Mr. Serrill, be a much greater degree of participation by trade associations in the direction of the national industrial standardization movement.

The National Association of Master Plumbers and the Heating and Piping Contractors National Association are organizations in the plumbing and heating industry which have been working as part of the standards committee, and will continue as members of the new standards association.

NEW YORK CHAPTER INSPECTS LABORATORY

The November meeting of the New York Chapter, American Society of Heating and Ventilating Engineers, was held at the Institute of Thermal Research, American Radiator Co., in Yonkers, N. Y., instead of the usual place. The meeting was also held a week earlier than usual, being held on Monday evening, November 12, in order to take advantage of the opportunity to visit the laboratory.

Practically all of those in attendance left the Grand Central Station in New York City at 6:19, being met at the Mount Vernon station by special buses, which conveyed them to the laboratory, at 675 Bronx River road. Dinner was served, and Dr. Charles W. Brabbee, director of the institute, delivered an address on "Miscellany about radiators, humidity and boilers." Following the talk, equipment for testing boilers and radiators, and also a new magazine boiler for various types of fuel, were inspected. The meeting ended in time for the party to catch a 10:14 train at Mount Vernon for New York City.

NOVEMBER MEETING ILLINOIS CHAPTER A. S. H. V. E.

Members out of the city celebrating Armistice Day lowered the average attendance of 93 of the Illinois Chapter American Society of Heating and Ventilating Engineers to 63 for the November meeting on the evening of the 12th. This was conceded to be one of the most interesting meetings the chapter has ever held.

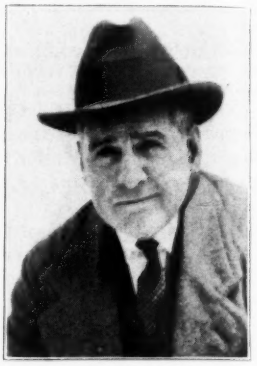
The speaker of the evening was H. P. Johns, head of the house heating division of the Peoples Gas Light & Coke Co., Chicago, who spoke on the subject of gas, illustrating his remarks with a stereopticon.

William G. Bergner, new member, Illinois Chapter

Charles W. DeLand, secretary, Illinois Chapter

The relation of manufactured gas and natural gas was explained. With the assistance of diagrams projected on the screen, he described the various processes in the making of gas. The early history of gas was outlined, accompanied by pictures of early and recent gas heating and cooking appliances. The practical application of gas to the heating of homes was dwelt upon at some length, and

T. H. Monaghan, vice president, Illinois Chapter



H. G. Thomas, president, Illinois Chapter

it was stated that the use of gas for home heating in Chicago is increasing about 20 per cent each year. Many questions were asked and answered at the close of the address.

A. L. Weixel, Chicago, James H. Milliken, Reed Air Filter Co., Chicago, and John D. Small, consulting engineer of Chicago, reported on the golf tournament; Carl W. Johnson of C. W. Johnson Co., Inc., Chicago, and John Howatt, operating engineer of the Chicago board of education, are to join with a committee from allied societies in the preparation of a golfing program for 1929.

The annual meeting of the A. S. H. V. E., to be held in Chicago in January, 1929, was again announced and plans are maturing for making this a very attractive meeting.

BAYONNE ASSOCIATION RE-ORGANIZED

At a meeting of the Bayonne (N. J.) Master Plumbers Association, held Thursday evening, November 15, at the Industrial Y. M. C. A., plans for re-organization were effected, and a new set of officers elected to carry on the work of the association. William C. Devlin was elected president of the association, and he will be assisted during the year by the following other officers: Leo S. McCabe, vice president; John A. Cook, recording secretary; John H. Nolan, financial secretary; James Loomis, treasurer. The following trustees for the association were also elected: Morris Newell, Charles O'Connor and Louis Fekete.

Edward B. Moore, field secretary of the New Jersey State Association of Master Plumbers, was present at the meeting, and was instrumental in re-organizing the association. It was decided to hold meetings every two weeks, and the re-organized association will become affiliated with the state association.

JAMES F. MADDEN CALLED BY DEATH

James F. Madden of Sherman, Tex., died at his home in that city on Sunday evening, November 18. He was long active in association affairs, and served as the first president of the Associated Master Plumbers of Texas, afterward being of great assistance to other officers of the state association in administering its affairs. Burial was held in Sherman on Wednesday, November 21, and a number of those in the trade were in attendance.

Markets

(Continued from Page 56)

started some time ago are now very much in evidence.

As a rule, makers are able to effect shipments in accordance with distributors' requests, although increased receipts have had effect, in some instances, on the speed which formerly attended forwardings from sources to distributing points. Manufacturers' prices continue to be of firm nature, especially where plumbers' brass goods and soil pipe are concerned. During the week the majority of manufacturers of brass valves and brass fittings advanced their prices to wholesalers approximately 5 per cent. Other types of fittings were not changed in price.

Soil Pipe

The amount of business placed by jobbers at the time of the recent advance in makers' prices was not extensive and foundries are readily disposing of these lower priced orders. Roughing-in processes are steadily decreasing and master plumbers' requirements consequently account for less active turnovers of jobbers' stocks. The majority of distributors have sufficient quantities of soil pipe on hand or in transit to cover their needs for some time.

Pipe—Brass, Steel and Wrought Iron

Makers of brass pipe continue to find an active demand for their product. Jobbers are not in any way committing themselves beyond their immediate needs, but daily shipments to their customers necessitate frequent reordering. Steel pipe, too, is in good demand, particularly in the heating field, which fact accounts for the good volumes accruing to distributors and mills. Wrought iron sales are reported as seasonably satisfactory by makers.

Fittings

Makers' volumes consist mostly of fill-in orders which, taken over weekly periods, are of satisfactory breadth. Cast iron and malleables continue to hold jobbers' interest, for heating installations are absorbing sufficient quantities as to make the upkeep of good assortments a matter of frequent attention on wholesalers' parts. Factories are operating on such schedules as to forward without delay. During the week the majority of manufacturers issued new sheets advancing their prices to wholesalers about 5 per cent. Makers' quotations on malleable and cast iron fittings remain unchanged.

Enameled Ware

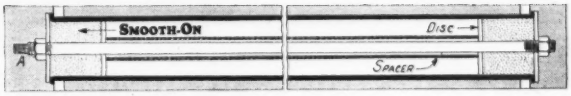
Activities in this market seem to hold at the good level which obtained during previous weeks. Finishing processes, both in major operations and in residential construction, sustain interest of jobbers and account for a continually steady flow from manufacturing points. Although in possession of good stocks for contractors' near-at-hand requirements, jobbers are purchasing with care.

Pottery

Shipments into this territory continue to make quite an impressive showing, jobbers' orders being fairly well divided between staple items for replacement purposes and more expensive pieces for definite operations. While distributors are not extending their inventories, they state that good stocks of staples are essential to serve master plumbers' frequently recurring needs. No price changes were effected by makers.

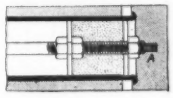
Plumbers' Brass Goods

Most all manufacturers of plumbers' brass goods have now fallen in line with the recently adopted higher scale of prices. Good bookings were generally reported by manufacturers' representatives at the date of advance, which left the past week inactive in new transactions with wholesalers, but prolific in actual shipments. Consumption needs are still quite substantial and jobbers believe



BAGGED, BLISTERED OR LEAKY TUBES OR FLUES – Blank them off with

SMOOTH-ON NO. 1



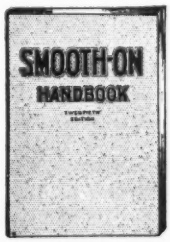
THROUGH lack of a renewal tube or because shutdown for complete renewal is not at the time permissible, a tube or flue that has gone to the bad somewhere between the ends may have to be blanked off temporarily. In such an emergency, the loss of the small amount of heating surface is of no consequence.

The form of tube stopper shown can be depended upon to stay tight under any temperature and pressure and to check the leakage and danger *completely* until the tube is renewed.

The repair requires only readily obtainable material —a rod with threaded ends and nuts, an inner pipe fitting over the rod and acting as a spacer, and discs cut from plate metal to slide over the rod and fit the tube. The variation shown in the second illustration dispenses with the spacer. The outer discs may go over or fit into the tube ends. A flat cut onto one end of the rod (A) and held by a wrench will prevent twisting of the rod in final tightening.

After placing the rod and two inner discs, the cups so formed are packed tightly with SMOOTH-ON No. 1, and the outer discs are drawn down by the nuts to force the SMOOTH-ON into full contact. The expansion of the SMOOTH-ON in hardening makes the seal absolutely tight until chipped out in the final tube renewal. The plugs can be placed while the fire is banked and will be ready for service before pressure is restored.

Get Smooth-On No. 1 in 1 or 5-lb. can or 25, 50 or 100-lb. keg from your nearest dealer or if necessary direct from us.



THE SMOOTH-ON HANDBOOK FREE

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Twentieth Edition—136 pages of data—193 diagrams, pictures and practical hints on at least 200 different uses for SMOOTH-ON. Every progressive engineer should have this book—get your copy now.

Do it with SMOOTH-ON

SMOOTH-ON MFG. CO.
Dept. 12, 570 Communipaw Ave.
Jersey City, N. J.

Please send copy of the SMOOTH-ON Handbook, 20th Edition.

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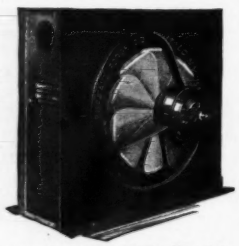
11-24-28

For low cost, easily installed flexible and reliable heating—insist on Breezo-Fin Units



Breezo-Fin Unit Heater

"Buffalo" Breezo-Fin Heaters, which are a combination of a fin-heating coil and a Breezo Fan cost considerably less to install and operate than direct radiation.

They are simple to install. With electric current and steam line available, a Breezo-Fin Heating System can be hooked up in a very short time. Easily adjusted to any temperature desired, as each unit is independently controlled.

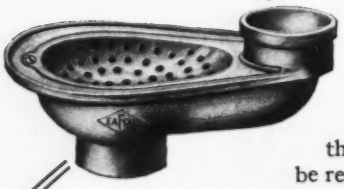
Write for complete particulars

BUFFALO FORGE CO.
483 Broadway :: Buffalo, N. Y.
IN CANADA
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Our Catalog

THE "EAFCO"

CESSPOOL and RAINLEADER



Made with a heavy solid frame and so designed that the strainer can be removed for inspection or replacement without breaking the cement around the drain.

Ask your jobber to show you one for your next job

The EASTERN FOUNDRY CO.
Main Office and Factory
BOYERTOWN PENNA.

Philadelphia Office: 940 Drexel Bldg.
Boston Office: P. O. Box 63, Cambridge, Mass.
New York Office: 50 Church Street

that the balance of the year will continue to hold up well. Even though some producers are hard pressed in making immediate shipments, no serious extensions appear.

Range Boilers

There was little change noted, in both manufacturing and wholesaling mediums, in the complexion of the range boiler market. Demand is not what might be called brisk, but is, nevertheless, about as good as makers anticipated for this season of the year. Jobbers' stocks are adequate for the present and replacements can be obtained promptly from factories. The price situation, from both manufacturers' and wholesalers' standpoints, is firm.

Boilers and Radiators

The majority of manufacturers seem well pleased with the volume of business which they are sharing. Heating installations have not appreciably diminished in numbers and contractors are still running good sized working crews. The bulk of the orders placed with makers is intended for immediate use, little of this material leaving makers' plants remaining long in distributors' warehouses.

PACIFIC COAST

Current Activity Is Fair—

Coast business continues to hold at the same level it has established for the past few weeks and, on the whole, is fairly satisfactory, with demand for materials better in some sections than in others. Distributors' prices continue to vary somewhat in the different jobbing centers.

Soil Pipe

The recent price advance on soil pipe was instrumental in increasing shipments from jobbers' stocks during the past few weeks, but, outside of these orders, little new business is evident. Coast distributors generally carry a 90-day stock in order that all of the trade's needs can be promptly supplied.

Pipe—Steel and Wrought Iron

The volume of steel pipe moving is about normal for this period of the year; and most of the trade continues to purchase only such pipe as is required for immediate use. Wrought iron pipe is moving in about the same volume as a year ago and, on the whole, a fair amount of tonnage is being moved.

Fittings

Most users of fittings are only purchasing in small lots as needs indicate. Most distributors have well balanced stocks and are able to make prompt shipments. Distributors can secure prompt shipment from manufacturers' warehouses and from factories. During the week most of the manufacturers announced a 5 per cent advance in their prices to wholesalers on brass fittings.

Enameled Ware

The demand for enameled ware continues to be of fairly satisfactory volume and, taken as a whole, the total amount of ware being used at present on the Coast is of good volume. Most distributors have good stocks and can obtain prompt shipments from manufacturers.

Pottery

A fairly well sustained demand prevails for pottery, which shows little change from week to week. Distributors generally are carrying good stocks and Coast potteries can make prompt shipments.

Plumbers' Brass Goods

The recent price advances by some manufacturers and distributors of brass goods brought forth considerable new business and demand continues to be active. Distributors generally are carrying sufficient stocks to take care of all of the trade's needs without delay and manufacturers in most cases are making prompt shipments.

Hydraulics and Pneumatics of House Plumbing

(Continued from Page 43)

where traps are unvented, the intensity of siphonage transmitted to a trap is practically independent of the ordinary lengths of waste pipes used in plumbing. Actually the intensity of the vacuum is slightly diminished by transmission through a waste pipe. Where the traps are well vented, a greater intensity of siphonage is required to break the seal of a trap which is close to its vent, than that of a trap which is far away from its vent. As the distance between the trap and the vent is increased, the intensity of siphonage necessary to break the seal of the trap is diminished.

"It is impracticable from these tests, to fix a limiting distance between a trap and its vent. The tests indicate merely that it is desirable to place a vent as near as possible to its trap, and that a vent placed some distance away from a trap may become only one-half as effective as

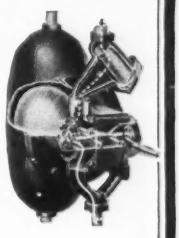
Table A
Results of Self-Siphonage Tests*
Standard Lead Traps

Type of Trap	Size of Trap and Waste Pipe In.	Length of Horizontal Waste Pipe In.	Length of Vertical Waste Pipe In.	Seal Volume Cu. Cm.	Critical Rate of Discharge Gal. per Min.	Run No.
P	2	0	0	220	64	1
P	2	0	17	220	32	2
P	2	0	30	220	26	3
P	2	53	0	220	38½	4
P	2	53	15	220	41½	5
P	2	53	30	220	39	6
P	1½	6	0	165	13½	7
P	1½	6	15	165	10	8
P	1½	6	30	165	11	9
P	1½	53	0	165	10½	10
P	1½	53	15	165	9	11
P	1½	53	30	165	8½	12
P	1¼	53	0	88	10	13
P	1¼	53	15	88	8	14
P	1¼	53	30	88	7	15
P	1¼	0	0	88	24	16
P	1¼	0	15	88	11	17
P	1¼	0	15	88	10	18
P	1¼	0	30	88	9	19
S	2	0	8½	198	53½	20
S	2	0	15	198	28	21
S	2	0	30	198	26½	22
S	1¼	0	5½	58	18	23
S	1¼	0	15	58	10	24
S	1¼	0	30	58	7	25
Bag	2	0	7½	188	58	26
Bag	2	0	15	188	36	27
Bag	2	0	30	188	33	28
Bag	1½	0	7½	106	20	29
Bag	1½	0	15	106	11½	30
Bag	1½	0	30	106	11	31
Bag	1¼	0	7½	44	56	32
Bag	1¼	0	15	44	25	33
Bag	1¼	0	30	44	13½	34
Running	2	0	30	204	44	66
Running	2	0	45	204	41	67
Running	2	0	60	204	33	65
Running	2	0	90	204	34	68
Running	1½	0	90	74	20	58
Running	1½	0	120	74	28*	59
Running	1½	0	150	74	28*	60
Running	1¼	0	30	52	35*	62
Running	1¼	0	45	52	36½	63
Running	1¼	0	60	52	31	61
Running	1¼	0	90	52	14	64

*This is the fastest rate at which water would pass through the trap. The seal of the trap was not broken at this rate.

Self-cleaning in the hardest water

Over a year's continuous service, 24 hours per day, with water of 38 grains hardness—and never cleaned once. You can do it with M & M Self-Cleaning Duplex Boiler Feeder.



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Flush Valves **for use in combination with all styles of bowls for all classes of service to operate under low or high pressure water supply.**

Water Closets **for every type or class of service.**

Frost Proof Closets. **Direct flush or after flushing.**

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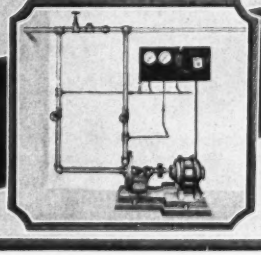

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Fig. T 1401
Write for Bulletin T-1400
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EASY TO GET
Most of the better jobbers thruout the country handle Trenton Brass Products.
This means that these fine fittings are always available for our rush jobs.
The fact that so many jobbers have them is proof positive of their popularity.
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Trenton, New Jersey
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one close to the trap. It is obvious that a vent placed a long distance away from a trap is valueless in preventing the self-siphonage of the trap."

If you are familiar with plumbing codes, you will know that this feature that the Illinois report covers, that is, the safe distance of vents from their traps, is a subject that is considered by such plumbing codes in various ways, with a resulting great diversity of requirements in various cities.

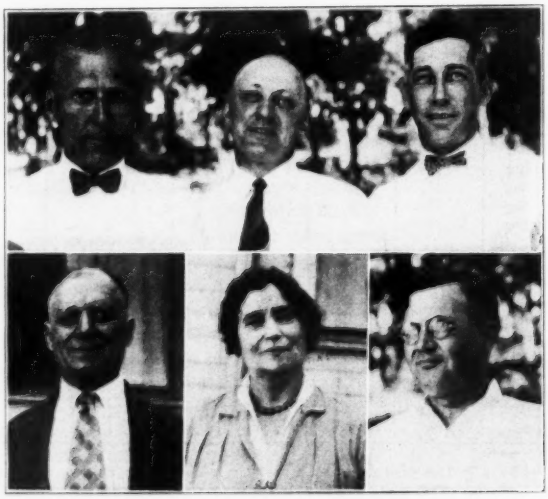
In view of the light that the Illinois investigation throws upon the subject, it occurs to us that it would be a very interesting thing to make a study of the requirements on this phase of venting shown by the various codes of leading cities, and discuss them from the standpoint of the Illinois tests. We will endeavor to do this in a later article.

NEW JERSEY DIRECTORS RECEIVE REPORTS

The board of directors of the New Jersey State Master Plumbers Association met at the Elm Tree Inn, in Westfield, N. J., on Tuesday, November 13, all members of the board except Charles Loveman of Atlantic City being present. State President William N. Chesnut of Montclair, presided.

Reports from various committees, including the sanitary code, legislative and educational committees, were received. Charles Koster, East Rutherford, chairman of the legislative committee, told of the efforts of that committee toward the passage of a state sanitary code, and George L. Bird, of Elizabeth, chairman of the educational committee, said that plans were being formulated for instituting accounting classes at various cities throughout the state. A report was also received from the field secretary, Edward B. Moore, who told of the efforts being made to improve conditions. Visitors included Andrew A. Taaffe, president of the Newark association, and Ira Morris, secretary of that body.

A letter from National Secretary Penfrase of St. Louis, commending the state association on the copy of the proceedings of the annual convention which he had received, was read, and it was announced that each member now had received a copy. The members had dinner together in the evening, and later attended the meeting of the Westfield Master Plumbers Association.



Top row: W. N. Parks of the U. S. Radiator Corp.; Emil T. Kolar; W. M. Walsh, manager of the St. Paul branch of the Central Supply Co. Bottom row: Mr. and Mrs. J. G. Zeiniet; H. V. Adams of the Wolverine Brass Works. Photos taken at the annual outing of the St. Paul association

A Copper Service Tube Plumbing Installation

(Continued from Page 28)

bends at the left of the picture connect directly to the built-in wall fixtures for the bathtub. In the estimate on this building the copper tube and fittings were listed as costing the plumber $45.65.

It is claimed that copper service tube, on account of its ductility, will stand successive freezings without bursting.

Fig. 8.—Making the flanges

Fig. 11 is another view taken looking upward in this dwelling, and shows copper tube leading from the tees in the bathroom directly to the built-in tub. Fig. 12 is a general view of the tube and the fittings, showing the way in which they are used.

The plumbing fixtures in this dwelling are high grade

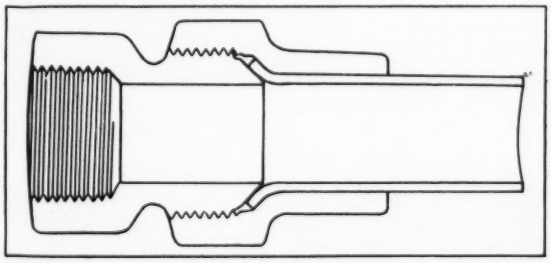


Fig. 9.—A cross section of a copper to iron, copper service tube connection

throughout. Two bathrooms are located on the second floor. The owner's bathroom is equipped with a five and one-half foot tub, large pedestal lavatory, a china dental lavatory, siphon jet closet and built-in shower with a German silver trim glass door and medicine cabinet.

The guest bathroom has a five and one-half foot recessed bath, siphon jet closet, enamel iron pedestal lavatory and medicine cabinet.

On the first floor is a toilet room consisting of a closet

if

larger profits
and satisfied
customers mean
anything to you
then be sure
to install
acid-proof Duriron
soil pipe for
that next acid
waste job

Duriron is no
more corroded by
acids than other
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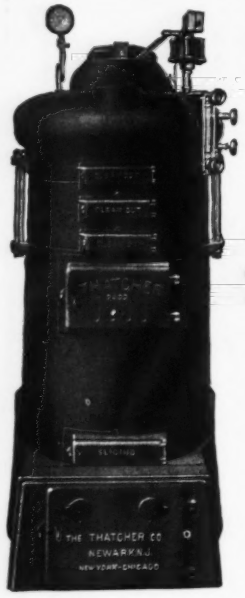

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"Staggered Fire Travel" flue and dome construction as utilized by Thatcher assures users of the lowest possible heating cost. Conservative ratings of Thatcher "Round Boilers" enable you to guarantee satisfactory service in every installation.

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THATCHER
BOILERS-FURNACES-RANGES

Fig. 10.—Looking upwards at part of the plumbing pipes

combination, a built-in shower and also a medicine chest or cabinet.

Color figures prominently in these installations. The owner's bathroom is fawn; in the guest bathroom pink is the motif, while in the kitchen the acid resisting enamel

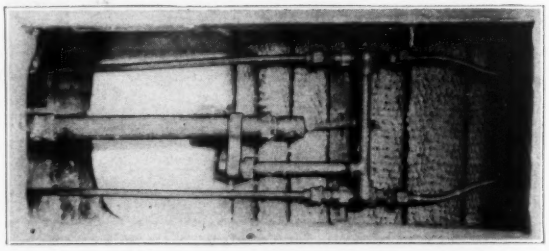


Fig. 11.—Looking upwards, showing copper service tube leading from the tees in the bathroom to the built-in tub

sinks have a green color. The basement is equipped with a closet, lavatory and built-in shower, as well as laundry tubs and an automatic gas water heater, which has proved a most ideal arrangement.

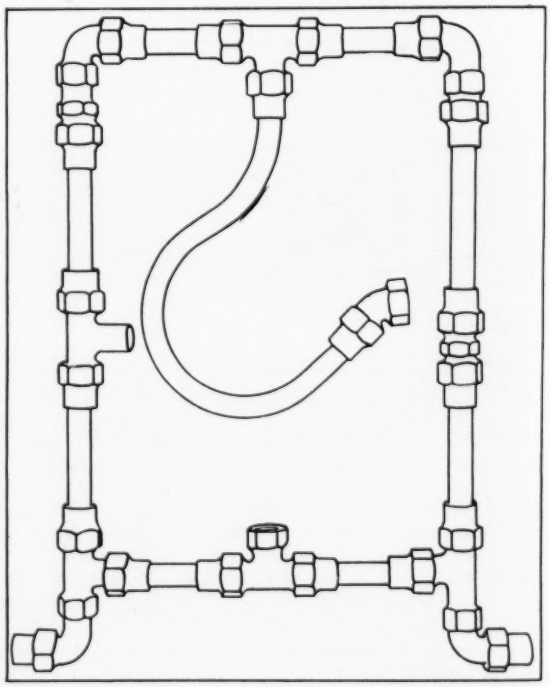


Fig. 12.—A general view of compression fittings showing their application

Progress Shown by Wisconsin Association*

WISCONSIN is a progressive state, not in politics alone, but also in plumbing. Wisconsin has the most comprehensive plumbing code of any of the states in the Union. This distinction was accorded to Wisconsin in a pamphlet devoted to plumbing recently issued by the United States Department of Agriculture. Wisconsin has always held a high place in the national association, and justly so. We have held every office in the national association, from the high office of president all the way down.

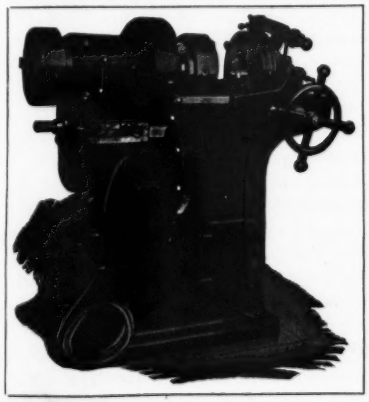
Wisconsin has done excellent work in the past few years in organization, and has doubled its membership. We have divided the state into 10 zones, and each zone holds meetings every 30 or 60 days, thereby holding the interest of the members in association affairs. It is a serious mistake, in our opinion, to gather members together once a year at a state convention and then entirely abandon them. Members in small communities, and isolated members, cannot maintain an organization of their own, and these zone meetings seem to solve the problem. At times the state officers or directors address the meetings. The ladies' auxiliary has been a wonderful help in holding the members' interest in association affairs. The ladies, too, gather at the zone meetings and make a social affair of them, usually concluding with an evening dinner at some hotel.

Wisconsin was one of the first states to adopt a Workman's Compensation Insurance Act, and the master plumbers of Milwaukee organized an insurance company of their own in 1913. The insurance company has proved to be very successful, and is probably the greatest factor of strength in any of our undertakings. It provides us with adequate insurance, covering workman's compensation, public liability, and automobile, personal and property-damage insurance. One of the conditions of the policy is that the policyholder must keep a comprehensive set of books. This is of utmost importance to the trade. When one auditor went out in 1913, he found a most deplorable condition of bookkeeping, or rather no bookkeeping, in many of the shops. Records were kept on pieces of paper, and when the job was done, these papers were destroyed. This very sorry condition has been entirely remedied. This insurance company is available to any member of the Wisconsin state association.

Our insurance company has proved to be very profitable and to pay dividends from 65 per cent to 85 per cent in each year's business, and has a surplus of over $6,500 invested in bonds. A letter on file from the State Commissioner of Insurance, commends us highly on our condition and methods of doing business. This insurance company also helps us to maintain an office with a competent secretary, clerk and stenographer at the disposal of the Wisconsin state, and Milwaukee members, where visitors are always welcome and information regarding any of our activities is obtainable.

We have another insurance company, much smaller than our liability company. It fills a want and is of profit

*The above is an excerpt of an address made by Lewis R. Friend of Milwaukee, president of the Wisconsin Master Plumbers Association.



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For Production and Precision Threading

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2. Automatic Die Head
3. Three Speeds
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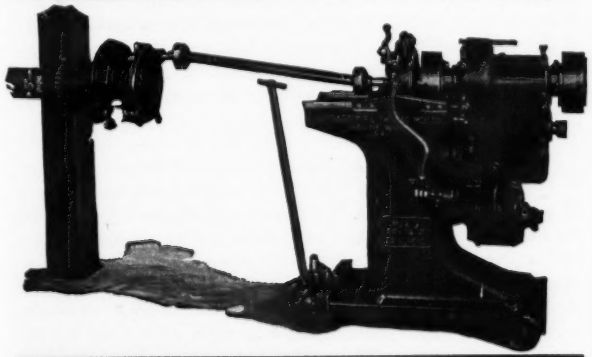

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Like all other Enterprise Brass Goods, the Enterprise Ball Cock is built by careful workmen from the very best metal obtainable.

Each Enterprise has positively individual care in the exclusive Enterprise manufacturing process.

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All Lead-Copper-Galvanized Iron

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AUTOMATIC COAL BURNER

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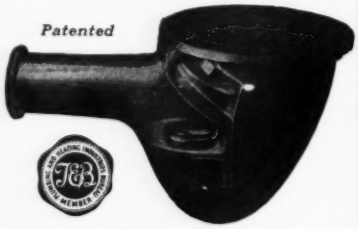

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In colors to harmonize
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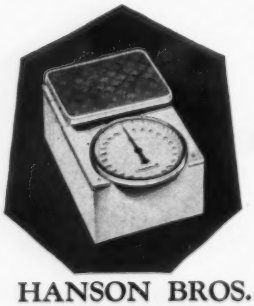

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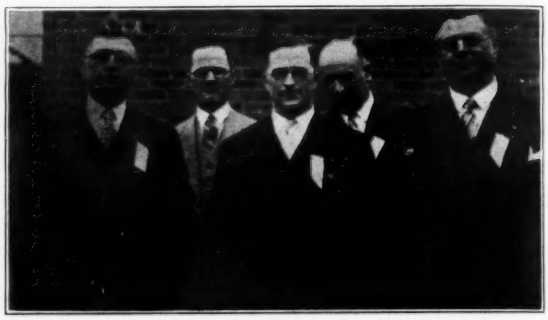
and benefit to our members who have joined it. It is a bathtub protective fund. We pay one dollar, in cash, for every bathtub we install, and that insures us against any costs, in case the tub proves to be defective and has to be replaced.

When a tub is thought defective, it is examined and passed upon. The manufacturer of the tub replaces it and the protective fund pays for the entire replacing, the



A group of members from Madison, Wis., at the recent convention of the Heating and Piping Contractors Wisconsin Association

tile work, plastering, painting and plumbers' time in such replacement, thus holding the plumber free from any costs. This fund also has proven to be very profitable, and has a good influence in holding the associations' interest. If the manufacturers of bathtubs will continue to make them as good and free from replacement defects as they have for the past few years, the interest on our surplus fund will take care of all replacements. We insure only tubs of approved makes.

Our ladies' auxiliary, though only two years old, has a large membership, both in the city and state. They entertain our lady visitors at the state convention and arrange picnics and entertainments for our members and their families, and also grace our social affairs by their presence. These different achievements are the result of co-operative work of many of the members and are the pride of the entire Wisconsin state association.

Since the enactment and passage of our plumbing code and plumbers' license and sanitation form, typhoid fever has decreased 75 per cent, and the writer was informed by a member of the state board of health that this decrease was in no small measure attributed to the good plumbing and the enforcement under the new code.

RICHMOND ASSOCIATION MOVES OFFICES

The offices of the Master Plumbers and Heating Association of Richmond, Va., Inc., were moved Tuesday, November 13, from 304 Builders Exchange, to rooms 109-110 in the same building. The move makes it possible to have extra room for the association, and being on the first floor of the building, makes it more convenient for members and visitors.

SUB-COMMITTEE FINISHES WORK

The important sub-committee of the committee on standardization of the Heating and Piping Contractors National Association, known as the sub-committee on depreciation, has recently finished its work. A report showing the body's ideas on the amount of depreciation that should be figured on various equipment used or maintained by heating contractors has been submitted to the parent committee. If approved by the standardization group, the report will go to the national board of directors for its study.

Woman's Page

"All our members read the Woman's Page with interest," writes the president of one of the large auxiliaries. Women in all parts of the country are interested in learning what the auxiliaries in other states are doing. They like, too, to feel that what they are doing is of interest to other women. Many of the secretaries are writing me regularly, but there are some who do not write as often as they might. Perhaps they feel that their organizations are not doing anything of sufficient importance to chronicle, but even the small items are read with interest. Thanksgiving Day will soon be here, and reports of holiday festivities of the auxiliaries will be helpful to other organizations which are planning for social events.

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Tells of Florida Suffering

Mrs. Roy E. Martin, president of the Women's Auxiliary to the Florida Master Plumbers Association, who has officially expressed, through the columns of the Woman's Page, her appreciation in behalf of the Florida association for the kindly assistance the storm sufferers have received, writes as follows to tell the part master plumbers and members of the auxiliary took in storm relief. Her letter follows:

"I have intended for quite some time to write you and tell you of the wonderfully good work that the master plumbers and women's auxiliaries have done in helping to take care of the injured in the storm of September 16.

"At the first report of the injured, the auxiliaries throughout the state began making, gathering and sorting clothing for the Red Cross. Money was also sent in. Master plumbers from every division went to Palm Beach to help in the rescue work. I made the trip to Palm Beach also to see if any of our master plumbers and families needed help. Fortunately they were all safe, and had not suffered to any great extent.

"In the course of a very few days, we began to receive help from the outside world—at least it seemed that way to us, when the checks and clothing and letters of sympathy began to come in from the auxiliaries all over the United States. We can't begin to tell you how thankful we were for this. It came in a time of need and sorrow, for we have all suffered from the effects of the hurricane.

"There are 1,836 reported dead and 1,870 injured. A total of 10,172 families are registered with the Red Cross for rehabilitation, and 1,323 persons are being fed by that organization. After all, we are the kind of men and women that can go ahead and look on the bright side of life, and we feel and know that our Father has been good to us in a great many ways, and we will all endeavor to do our best at all times. Thanking you all again for your kind consideration and generosity, I am

"Sincerely yours,

"(Signed) Mrs. Roy E. Martin, President,
"Woman's Auxiliary to the Florida Master Plumbers Association."

Los Angeles Auxiliary Prepares for Bazaar

The Women's Auxiliary of Los Angeles, Calif., has been working industriously for a bazaar which is to be held during this month. Meetings have been held frequently for a number of months for the purpose of sewing and making articles for this bazaar. At the last meeting the auxiliary contributed for the relief of two needy families. Officers of the organization recently attended a dinner, at the invitation of the Master Plumbers' Association of Long Beach, for the purpose of interesting the Long Beach women in the formation of an auxiliary.

Montclair Auxiliary Holds Masquerade

The Women's Auxiliary of the Master Plumbers Association of Montclair, Bloomfield, Verona and vicinity held a masquerade dance at the Elks Club, Montclair, N. J., Wednesday evening, November 7. The attendance was estimated at 200, the crowd dancing to the tunes of an excellent orchestra, and partaking of cold cider which exemplified the Hallowe'en season.

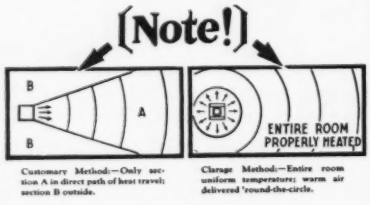
Costumes, of course, were attractive and original. The most comical one, in the opinion of the judges, was that worn by Mrs. V. G. Kane of Millburn, N. J. Honors for the most original costume went to Joseph Berg, secretary of the Orange Master Plumbers Association. The prettiest outfit was exhibited by Mrs. C. R. Morris, Paterson. The selections were made during the grand march, the judges being State President Mrs. Charles J. Samuel, Montclair; Past State President Mrs. Charles Zimmerman, North Hudson; Mrs. John Corcoran, Jersey City; A. G. Krieger,

Top row: Mrs. A. Blanchard, Mrs. M. Hyland, Mrs. John Fahy, all of Waterbury. Bottom row: A group of members of the women's auxiliary at the convention of the Connecticut Master Plumbers' Association, held recently in Waterbury

HEAT

distributed evenly ~ No overheating one part, attempting to warm the rest of the building.

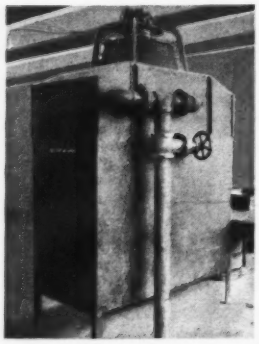
WHY are Clarage Unit Heaters so highly desirable for industrial application? The answer is simple—plain as day—easy to understand. Note the diagrams above.



Customary Method:—Only section A in direct path of heat travel; section B outside.

Clarage Method:—Entire room uniform temperature; warm air delivered 'round-the-circle.

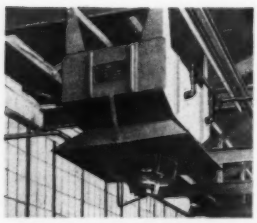
Clarage Unit Heaters, and only Clarage Unit Heaters, deliver warm air 'round-the-circle—have no cold sides. With this equipment, heat is discharged at high velocity in all horizontal directions and straight from the fan.



Floor Type Unit Heater installed in paper mill.

Therefore, no part of your building lies outside the direct path of heat travel; therefore, no need to overheat some parts to warm the rest. Clarage 'round-the-circle distribution provides equal heat for every nook and corner. Uniform, agreeable temperatures are easily maintained—maximum economies effected.

Clarage Unit Heaters are built for either floor or ceiling installation as shown — three sizes to meet all factory and garage requirements where steam or hot water is available. Write for literature, or consult with our engineers—No obligation.



Ceiling Type Unit Heater installed in automotive plant.

CLARAGE FAN COMPANY
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Sales Engineering Offices in Principal Cities

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Unit Heaters

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STANDARD EQUIPMENT

All Clarage Unit Heaters utilizing steam or hot water have Aerofin (The Standardized Light Weight Heater) as the heating element. Aerofin is made of copper and brass—non-corrosive, imperishable light-weight. It is highly efficient guaranteed steam and water tight. Engineers endorse it.

North Hudson; William Chesnut, Montclair, and Joseph McGinity of W. V. Egbert Co., Newark.

The committee in charge included Mrs. William Garner, Mrs. David Van Sant, Mrs. James Garner, Mrs. Harry Burnett, Mrs. Alfred J. Hoffman and Mrs. James Fitzgerald. Mrs. Fitzgerald is president of the local auxiliary, Mrs. Walter Galloway is vice president, Mrs. Louis Hutchings, secretary, and Mrs. Van Sant, treasurer. Trustees include Mesdames Burnett, Garner and Henry Williamson, and the sergeant-at-arms is Mrs. Robert Whyte. State officers of the auxiliary present included, besides Mrs. Samuel and Mrs. Van Sant, Mrs. William T. J. Orriss of North Hudson and Mrs. Charles Werner, Jersey City. Dignitaries of the master plumbers' associations present included Mr. Chesnut, who is state president; Henry Williamson, president of the Montclair association; Mr. Krieger, who is state vice president; Charles Zimmerman, past state president; A. A. Taaffe, president of the Newark association, and George Brenner, president of the Oranges association.

Dance to Be Given by Milwaukee Auxiliary

Members of the Ladies' Auxiliary of the Milwaukee Master Plumbers' Association are busy on plans for a dance to be given at the Wells-Colonial Hall, November 27. The ladies have just completed an extremely successful series of theater parties, according to Mrs. Joseph Brah, secretary of the organization, at which a considerable amount of money was brought into the treasury. A business session was held Monday, November 5, at the Stratford Arms Hotel. Routine business matters and plans for the dance were discussed.

Allentown Auxiliary Holds Masquerade

The Ladies Auxiliary of the Master Plumbers Association of Allentown, Pa., held a masquerade party at the Saeger bungalow in that city on Friday evening, October 26. There were 42 masked couples present at the cottage, which was decorated with colors suitable to the Hallowe'en occasion. After dancing to the tunes of a splendid orchestra, prizes were awarded for various costumes. Among the prize winners were Mr. and Mrs. Henry Berninger, attired as doctor and Red Cross nurse, Mr. and Mrs. Harold Siegfried, arrayed as farmerettes, Paul Ettinger, who was the best dressed lady and won first prize, P. C. Lobach, dressed in a Buster Brown costume, Mr. Kohler of Walls, Owen & Stambach Co., in a Spanish costume, and Mr. Letitig, voted the handsomest gentleman in evening dress.

Portland Women's Auxiliary Plans Evening Party

Mrs. Parker recently entertained twelve members of the Women's Auxiliary of Portland, Ore., at her home in Multnomah. Luncheon and business, as well as a social hour, featured the meeting. Plans were made for an evening party to be held in November at the home of Mr. and Mrs. George Kendall, at which time the husbands of auxiliary members were to be entertained.

Activities of North Shore Auxiliary

The October meeting of the Women's Auxiliary to the North Shore Sanitary Engineers' Association was held at the residence of Mrs. V. J. Killian of Glencoe, Ill. Besides the fifteen members present, the guest of honor was the president of the Woman's Auxiliary of the Illinois Master Plumbers' Association, Mrs. Robert Liss. After the business had been disposed of, the members indulged in a game of cards, with honors going to Mrs. Perry Wallace, Mrs. Robert Liss and Mrs. Fred Flader. After refreshments were served a social hour was spent before the meeting was adjourned.

An evening of cards and bunco was enjoyed at the residence of Mrs. George Wood of Hubbard Woods, Ill., on

Friday, November 2, by the auxiliary members and their husbands. At cards, honors went to Mrs. Cedric MacArthur, Mrs. George B. Swift, Mr. and Mrs. Fred Flader, S. J. Steffens and George Wood. At bunco the winners were: Mrs. George Wood and Mrs. N. J. Mergenthaler. Refreshments were served in abundance, and all the guests expressed their pleasure at being present.

Youngstown Auxiliary Holds Quarterly Meeting

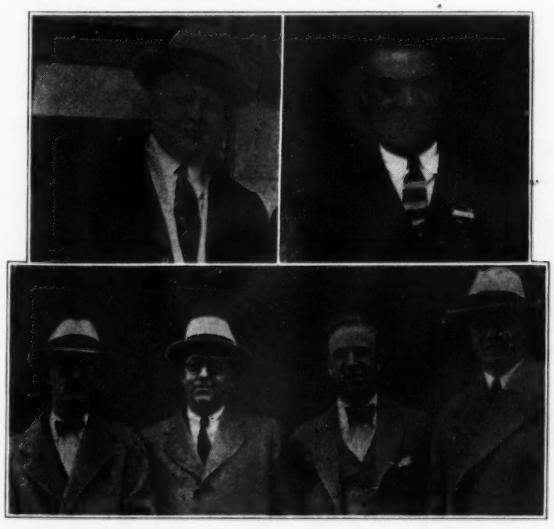
The Auxiliary of the Master Plumbers' Association of Youngstown, Ohio, recently held its quarterly business session in the club rooms at 219 Lincoln avenue. Mrs. Wilson, president, was in the chair. At this meeting the members voted to procure chair covers for the club room chairs. A talk by Judge C. M. Woodside on "A Psychopathic Hospital for Youngstown" followed the usual business routine. Vocal selections by Mrs. Gibson, accompanied by Mrs. Miller, were received enthusiastically.

Syracuse Auxiliary Holds Party

The Women's Auxiliary of the Master Plumbers' Association of Syracuse, N. Y., held its first meeting of the fall season recently at the home of Mrs. Arthur Cavanaugh, where a very pleasant afternoon was spent. Plans were made for the coming season. After business had been concluded, Mrs. Cavanaugh served a delightful lunch. At the meeting plans were made for a party in the form of a dinner and dance which was held at Turn Hall. All those who attended the party enjoyed the chicken dinner, and the chairman, Mrs. Frank Rinehart, saw to it that everyone had a good time in the way that he liked best.

HEATING AND PIPING CONTRACTORS TO EXHIBIT AT NEW YORK POWER SHOW

The Heating and Piping Contractors National Association has selected two booths, Nos. 558 and 559, at the seventh annual National Exposition of Power and Mechanical Engineering, which is to be held at the Grand Central Palace in New York City, beginning December 3. Three major ideas are to be stressed by the association in the exhibit. The first is certified heating, the second the development of engineering standards under the sponsorship of the national body, and the third is the responsibility of members of the Heating and Piping Contractors National

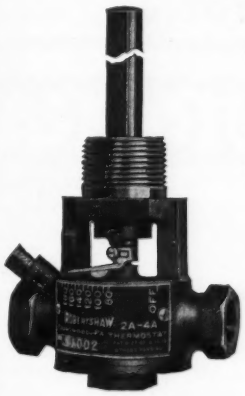


Top row: L. E. Moberg, Crane Co., East Chicago; D. E. Locke of Gardner Mutual Co., Chicago. Bottom row: J. M. Weil, Weil-McLain Co., Chicago; Carl Huettner of Gary; I. N. Soper, Warren Webster & Co., Chicago; R. E. Moore, Bell & Gossett Co., Chicago. Photos taken at the recent convention of the Indiana Society of Sanitary Engineers

Every Plumber Should Know About the Various Types of

ROBERTSHAW

Thermostats



Throttling Type

Throttling Type

For Side Arm Water Heaters or Automatic Storage Water Heaters
All sizes from 3/8 to 2 inches

Robertshaw Throttling Type Water Heater Thermostats are fully covered in

CIRCULAR FORM R-4
Write for it!

Snap-Action Type

For Storage Water Heaters and Furnace and Boiler Temperature Control. Gas Pipe sizes from ½ to 2½ inches

Robertshaw Snap-Action Thermostats are illustrated and described in

CIRCULAR FORM R-1
Write for it!

Snap-Action Type

Room Temperature Control

Room Temperature Control

Entirely Gas operated
Non Electric—No Volatile Liquids
Easily Installed
Attractive in appearance
Will control the Room Temperature within a range of 1½ degrees plus or minus

Robertshaw Room Temperature Thermostats are fully described in

CIRCULAR FORM R-3
Write for it!

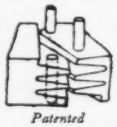
Any or all of the Above Circulars are yours for the Asking.

ROBERTSHAW THERMOSTAT CO.
YOUNGWOOD, PA.

When you install a Built-Well Seat, you've installed the finest one you can buy for long life, easy installation and good profit.

Buy Built-Well Seats for all of your jobs.

The Built-Well V-Lock Joint

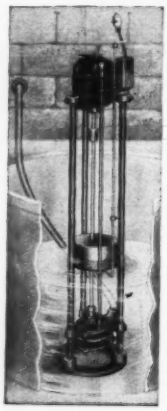


Sectional view of joint, turned upside down to show how dowels are inserted from bottom. Moisture only makes them tighter.

Patented

Look At the Construction

Built-Well Mfg. Co. 300 N. Robey Street Chicago, Illinois



AURORA

AUTOMATIC PIT & CELLAR DRAINAGE PUMP

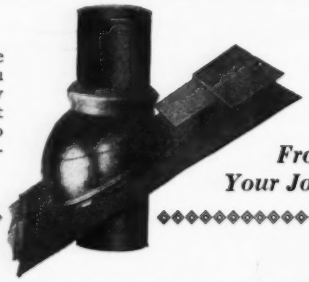
Most dependable unit to be had

Non-rusting shaft, non-rusting bearing, non-rusting pump proper. Delivers the maximum amount of water a ¼ H. P. motor can pull without overload.

AURORA PUMP COMPANY
AURORA, ILLINOIS

Manufacturers Deep Well Turbines, Centrifugal Pumps, Trench Pumps

If you selected the metal yourself, you couldn't find any better than that which goes into Bullard Roof Flashings.

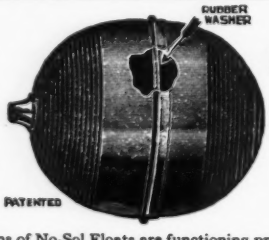


From Your Jobber

Easy installation—tight fit on any roof—reasonable price—no service—always at your jobber's—these are the reasons why Bullard Roof Flashings are so popular.

THE BULLARD SPECIALTY CO., Tiffin, Ohio

NO-SOL FLOATS



Millions of No-Sol Floats are functioning properly in service due to these facts:

1st. The float is full size, giving the necessary buoyancy.
2nd. The copper wall is heavy and uniform in thickness—for long life.
3rd. The patented spud insures complete protection against turning and leaking.

The Ayling & Reichert Co. 3047 N. Erie Street Toledo, Ohio

Top row: W. J. White of the Reading Iron Co.; George Wobensmith, B. Pennypacker and George Lucke, all of the Hajoca Corp. Bottom row: W. E. Cleaver of Arlington, Va.; E. A. Patterson of Charloti, Pa.; J. E. McGoldrick and Julius Lewis. Photos taken at annual outing of Washington, D. C., association

Association. It is hoped that the heating contractors and others interested in the heating industry will make the booths their headquarters when they attend the exposition. The exhibit is in charge of Henry B. Gombers, national secretary, who will be assisted by Joseph C. Fitts, Edward G. Byrd, field representative, W. E. Taylor, secretary of the Heating and Piping Contractors New York City association, and M. E. Durkee, secretary of the Heating and Piping Contractors Newark Association.

Epigrams—For Your Use

The average man is candid in admitting the faults of others.

* * *

When a man becomes wholly contented, he has outlived his usefulness.

* * *

Ambition is wound up with the key of hope.

* * *

There is such a thing as being too persistent at times.

* * *

What some people don't know they are always talking about.

* * *

A man reading his own biography would be very much surprised.

DOMESTIC ENGINEERING's Retail Advertising Service makes advertising easy for you—all you do is clip the copy from your copy of the paper and hand it, with the cut we send you, to your newspaper. Only $4.20 for 12 illustration cuts. Clip this, attach your check for $4.20 and mail today.

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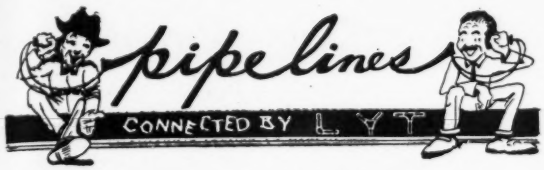


THIS IS THE WAY THE CHINESE REJECT MANUSCRIPTS

"We have read thy manuscript with delight. By the sacred ashes of our ancestors we swear that we never before have reveled in so enthralling a masterpiece.

"If we printed it His Majesty, the emperor, our high and mighty master, would ordain us to take it as model, and never henceforth to print anything inferior to it.

"As it would be impossible to find its equal within 10,000 years, we are compelled, though shaken with sorrow at our action, to return the divine manuscript, and for doing so we ask of thee a thousand pardons."

We present the following poem in a desire to help along a good cause. Clip it out and ask your local paper to publish it.

THE CHRISTMAS SHIP IS A SHIP OF HEALTH

I saw a ship a-sailing,
A-sailing on the sea,
(The captain is a merry wight—
As merry as can be—).
And every wind that moved the ship
Brought health to you and me.

Her sails were flecked with sunshine,
A pennant broad she flew,
(The steersman keeps her on her course
With hand both firm and true).
Her hold was stored with Christmas seals
For me and eke for you.

And every seal unloaded
From the barque of Better Health
(For you must do your part, you know,
To spread abroad her wealth)
Removes a child from danger
Of disease that goes by stealth.

So take the seals—a penny each—
The store the good ship brings,
(And hark the happy melody
That healthy childhood sings).
For every cent you use this way
Adds strength to love's own wings.

PAUL MASON.

"SY" SEZ

Two men left a banquet together; they had dined exceptionally well.

"When you get home," said one, "if you don't want to disturb your family, undress at the foot of the stairs, fold up your clothes neatly and steal up to your room."

The next day they met at lunch. "How did you get on?" asked the adviser.

"Rotten," was the reply. "I took off all my clothes at the foot of the stairs, as you told me to, folded them up neatly, and didn't make a sound. But when I reached the top of the stairs I found myself on an 'L' platform."

"What is your occupation?" asked the judge, sternly.

"I haven't any," replied the prisoner. "I just circulate around."

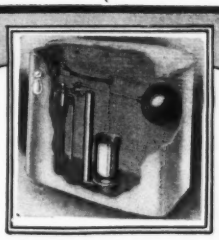
"Please note," said the judge to the clerk of the court, "that this gentleman is retired from circulation for thirty days."

He—"How about a little ride, cutie?"
She—"Going north?"
He—"Yes, I am."
She—"Give my regards to the Eskimos."

"SY" MARTIN, Owensboro, Ky.

"I don't want a thing for Christmas," many wives are saying to their husbands. Men who accept that statement at face value are either crazy, or they just don't care what happens to them.

L Y T.



Not cheap yellow metal, but rich, durable bronze and Chase copper tubing.

CURTIN TANK NOISELESS FITTINGS

A·F·CURTIN VALVE CO.
MEDFORD, MASS.

BATHWHITE

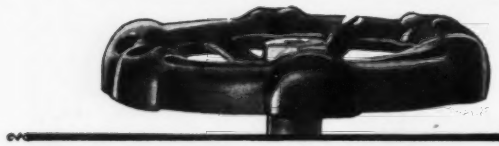
All Bathwhite Closet Fittings are guaranteed to give complete satisfaction on every job. Great care is exercised in their manufacture and there is no half way measure of quality about them.

Write us today regarding full details of the Bathwhite Enameled Closet Fitting Line.

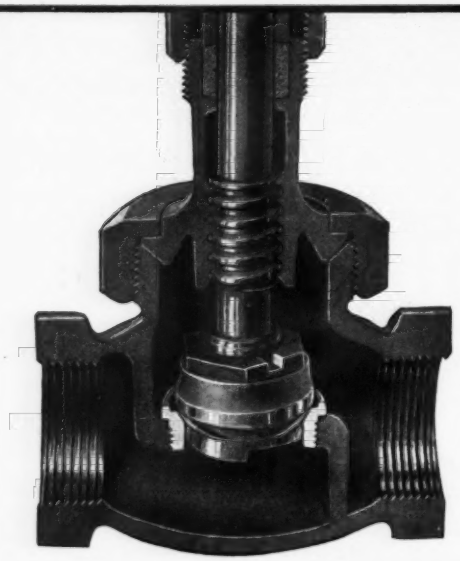
E. H. Titchener & Co.
126 Walnut Street
Binghamton, N. Y.

Send in this coupon — today — no obligation to you at all.

Name .....
Address .....
City..... State.....



For Severe Service



Specify Pratt & Cady "REDURO"

WHEN general service valves cause trouble due to bad water, throttling, or other out of ordinary conditions, use "REDURO" a line of special service bronze, globe and angle valves.

"Swift Metal," used for discs and seats, is a special nickel alloy developed in our own foundry. It is much harder than valve bronze, not easily scored and not readily destroyed by bad water. Re-grinding of disc and seat ring is made easy, without the need for special tools or breaking down the line.

"REDURO" Valves are available in sizes of ¼ in. to 2 in. and for pressures up to 300 lbs. Write for folder No. 15 which gives complete information and prices.

READING STEEL CASTING COMPANY, *Inc.*

An Associate Company of the American Chain Company, Inc.
Bridgeport, Connecticut
Offices and Warehouses in principal cities

READING for steel
PRATT & CADY for iron and bronze
specializing for quality valves and fittings
"there can be no compromise with safety"

For general service
Fig. 9

By removing the bonnet and inserting a nail or piece of wire through the disc lock-nut and stem, radial disc seat can be reground many times without removing valve from the line. Available in sizes of ¼" to 3" for pressures up to 250 lbs.

Bath a Day Movement

The Bath a Day Movement, now in its eighth year, is right in line with the ideas which educators, interested in conserving the health of school students and of adults, advance. At every meeting of medical men, for instance, some time will be given to a discussion of bathing. At a convention in Chicago in October, newspapers carried various articles headed, "Find Health in Bath Tub," etc. One was headed "Bath Tub Pronounced the Best Rejuvenator," and repeated the remarks of a medical man attending the convention to the effect that a short course of cold baths would do more to rejuvenate a man than some of the methods advanced by moderns.

169

Interest in health is nation-wide. That's why these inquiries for copies of "The Story of the Bath" represent such a splendid publicity opportunity. Is the name of your city here?

Lila Stutts,
CHILDERSBURG, ALA.

Dorothea Ross,
T. C. I. Instructors Cottage,
ENSLEY, ALA.

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PASO ROBLES, CALIF.

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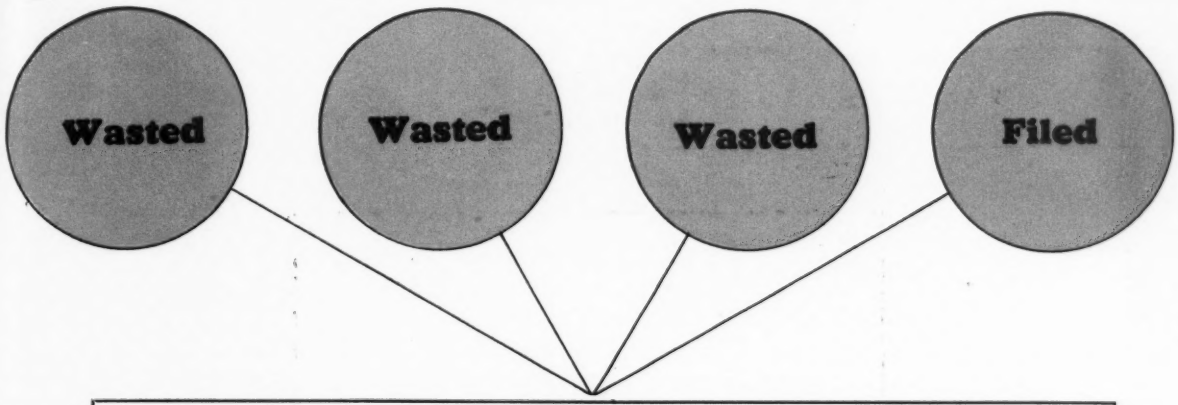
How to Eliminate Waste in Catalog Distribution



A recent survey shows that 3 out of 4 Catalogs and Circulars distributed by the average manufacturer of Plumbing and Heating Supplies are immediately discarded and aside from momentary attention value can be considered waste distribution.

How Above Percentages were Compiled

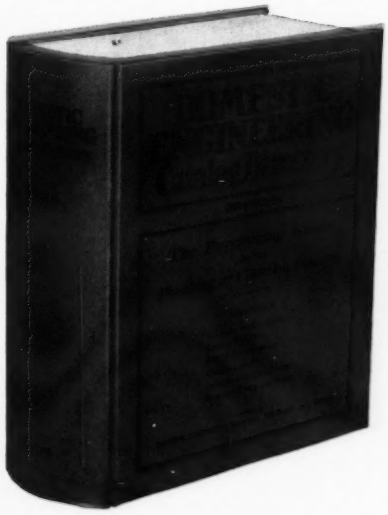
In a recent survey made by Domestic Engineering Company among the Wholesalers of Plumbing and Heating Supplies, all over the United States, the question of what happened to individual catalog and circular material was asked. It was discovered that an average of 75% of all the individual catalogs and circulars sent to the wholesalers by manufacturers is discarded immediately upon receipt.

Reasonableness of Percentages

This same survey showed that many wholesalers receive from 25 to several hundred individual catalogs and circulars through the mails in one week's time. It is readily seen how impossible it would be for a wholesaler to keep all this material in file. To do so, would necessitate having an extremely large filing space and would require all the time of one person to keep the material in shape so it would be of any use. It, therefore, seems most reasonable that at least 75% of this matter is immediately discarded.

What This Means to the Manufacturer

This means, when the average manufacturer puts out his catalog that as soon as it is off the presses and sent through the mails it runs the risk that only 25% of the total distribution is going to be useful. If this is true, it means that the net cost of the unit catalog is going to be materially increased. For example, if a manufacturer has 4000 catalogs printed at a cost of about 25 cents each, and only 1000 are used, this would make the net cost of each usable catalog $1.00. In many cases where expensive catalogs are produced the dollar and cents waste would be a great deal more than stated above.



Is the 25% Distribution Efficient?

The question now arises whether or not the catalogs that are kept in file work efficiently. A certain percentage of them will be misfiled, misplaced or lost in some way. Many of them will not be available when wanted. And it is practically impossible for a wholesaler to keep a complete index so he will know when to refer to some particular catalog. Therefore, while according to the survey 25% of the catalog distribution is put to use, this 25% is seen from this to be far from being 100% efficient. In fact, it is so decreased that the actual value of a total catalog mailing may amount to only about 10% as far as effectiveness is concerned.

What is the Remedy?

Manufacturers of Plumbing and Heating Products distributed through wholesalers are thus brought face to face with the fact that there is a tremendous waste of catalogs that should be eliminated.

The important thing then is to find a method by which a manufacturer's catalog can be kept constantly before the attention of the buyer, always up to date, carefully indexed to save a busy buyer's time, 100% efficient and economical in cost.

The answer is **"Domestic Engineering Catalog Directory,"** a Catalog of Plumbing and Heating Products built to the wholesaler's own specifications. A Catalog that is on the desks of practically every wholesaler of plumbing and heating supplies in the United States. A Catalog that is always ready to give the buyer information about any product manufactured in the Plumbing and Heating fields. A Catalog that is indexed and cross-indexed to make references simple and easy. A Catalog that is economical in cost and one that entirely eliminates the element of waste, assuring a manufacturer 100% catalog distribution and efficiency.

There are many more valuable facts regarding the advantages manufacturers gain by placing their catalogs in **Domestic Engineering Catalog Directory.** We will gladly furnish complete information on request.

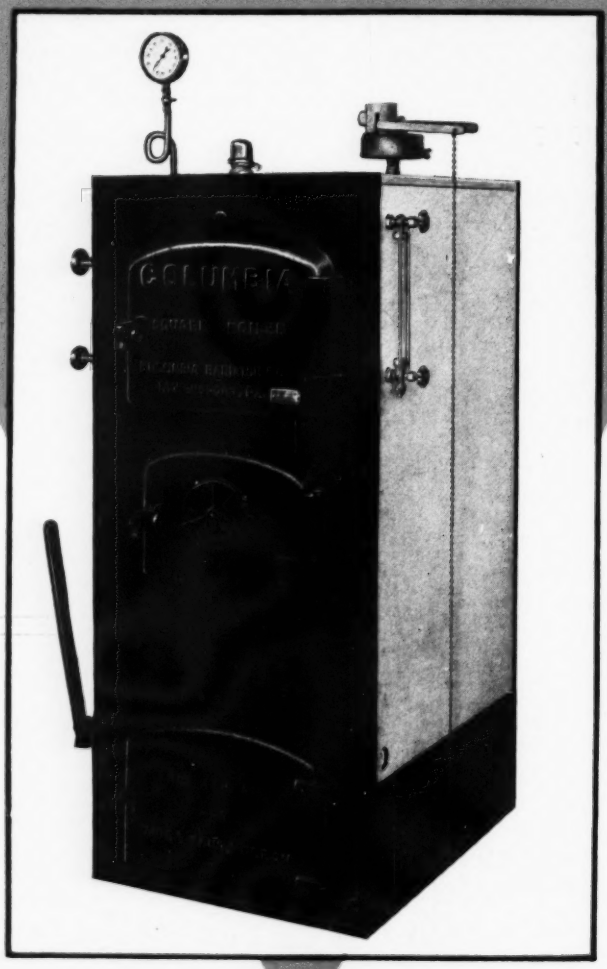
DOMESTIC ENGINEERING COMPANY

1900 Prairie Avenue Chicago, Illinois

COLUMBIA

JACKETED BOILER

~an ideal boiler for the home



Large ample flues

Long flue travel

Large heating surface

Rapid and efficient heating

Asbestos insulation minimizes heat losses

All interior parts accessible

Draft door on side of boiler

Erection of boiler and jacket very simple

Black enameled doors

Black and gray steel jacket

Boiler No.	Steam Rating	Water Rating	Hard Coal Fuel Capacity Lbs.	Base Dimensions	Grate Area Sq. Ft.	Flow and Return Tappings
417	400	675	145	24½ x 18	1.5	2—2½
517	575	950	195	24½ x 22	2.0	2—2½
617	750	1250	245	24½ x 26	2.5	2—2½
717	925	1550	295	24½ x 31	3.0	2—2½
817	1100	1850	350	24½ x 35	3.5	*3—2½
917	1275	2150	395	24½ x 40	4.0	*3—2½

Tappings provided for indirect water heater and hot water coils.

*8 and 9 section boilers have one additional return tapping on right hand side. Water line 46-inch. Flow tapping 56 inch. Smoke pipe 9 inch.

COLUMBIA RADIATOR COMPANY

PITTSBURGH
Office and Warehouse
McKeesport, Pa.
Phone, McKeesport 4175

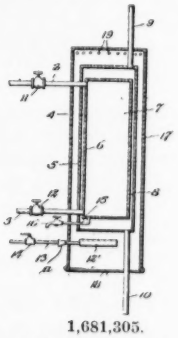
HARRISON, N. J.
Office and Warehouse
119 Bergen St.
Phone, Harrison 2900

NEW YORK OFFICE
Room 705
7 East 42nd St.
Phone, Murray Hill 9847

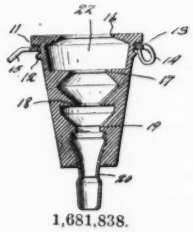
Plumbing and Heating Patents

Plumbing Department

1,681,305. Water Heater. Alphonse F. Moneuse, Valley Stream, N. Y. In combination with the water chamber of a boiler, a storage tank, a water heater interposed between said boiler and tank, said heater comprising inner and outer casings, providing inner and outer water chambers, valve connections between the boiler and the inner chamber, thereby enabling said inner chamber to be entirely cut off from the boiler, connections between the outer chamber of the heater and the storage tank whereby when the water is heated in the outer chamber it will be caused to circulate into and through said storage tank, means for draining the inner heating chamber, and means for supplying heat to the outer casing when it is desired to augment the heat in the outer chamber or to alone heat the water in said outer chamber, as and for the purpose described.



1,681,305.



1,681,838.

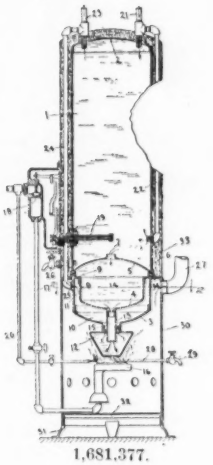
1,681,838. Faucet Connection. John Edward Conklin, Brooklyn, N. Y. A faucet connection of the character described comprising a body of soft rubber having a hollow interior, opening through the body at its upper and lower ends, the body being readily flexible throughout its entire extent the upper end of the body being formed with an inwardly projecting flexible annular faucet engaging flange and the interior of the flange defining the upper end of a suction chamber, the interior of the body being formed with a plurality of inwardly projecting annular flexible flanges successively decreasing in interior diameter from the top toward the bottom of the said body.

* * *

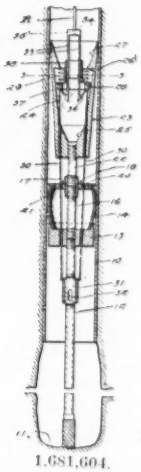
1,681,377. Storage Water Heater. Elmer S. Stack, Somerville, Mass. A water heater comprising a tank having a bottom head, a heating chamber depending from said bottom head in communication with the space enclosed by such head, and an inner partition crossing the interior of the tank above such head, said partition being constructed and arranged with a portion of its structure at a relatively high level, and another portion at a relatively low level forming a pocket for collection of sediment, and having an opening in said portion at the relatively high level for passage of water into the space between itself and the bottom head, and a tap leading from said pocket.

* * *

1,681,604. Electric Welding Mechanism. Joseph William Winter, Penfield, Pa., assignor to John Wood Manufacturing Company, Conshohocken, Pa. In electric welding apparatus, the combination with a stationary frame; of a rotary electrode shaft journaled upon a substantially horizontal axis in said frame; a rotary electrode carried by said shaft, at the end of said shaft remote from said frame; a pair of idle bearing rollers, in transversely spaced relation, below said shaft, adjoining said frame and remote from said electrode; whereby tubular bodies to be welded, of different diameters, may be exteriorly supported at one end by said idle rollers and interiorly supported at the other end.

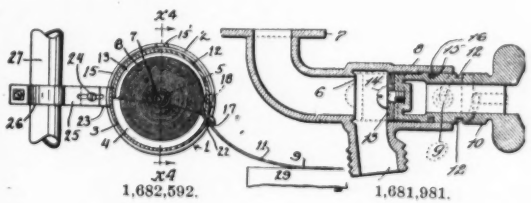


1,681,377.



1,681,604.

1,681,981. Drain. Charles F. Gilbert, St. Louis, Mo. In a drain of the class described, a casing having a smooth bore throughout its length, a hollow plug having an imperforate end and a helix and a circumferential groove in its wall, a valve, means for detachably securing the valve to the imperforate end of the hollow plug, and a removable element adapted to project into the bore and engage in said helix in the plug.



1,682,592.

1,681,981.

1,682,592. Toilet-Seat Accessory. Justin Neall Barker and Marjorie Nutting Barker, Santa Monica, Calif. A toilet-seat accessory comprising a semi-housing including end caps and a hollow semi-cylindrical body provided at one side with a notch; a hollow semi-cylindrical closure arranged between said caps and adapted to conform to said body when turned to open position, and adapted, when closed, to form in connection with the notched edge of said housing, a slot through which a strip of paper may be drawn from a roll inside the housing when the closure is closed; said before-mentioned closure having a projecting lip that forms a handle and a strip cutter for the purpose described.

* * *

1,683,336 Plumbing Device. Thomas Patrick Cummings, Chicago, Ill. A plug of the kind described, comprising an annular inflatable member; a spool within said annular member, a pair of discs adapted to co-operate with said spool and inflatable member, means to clamp said

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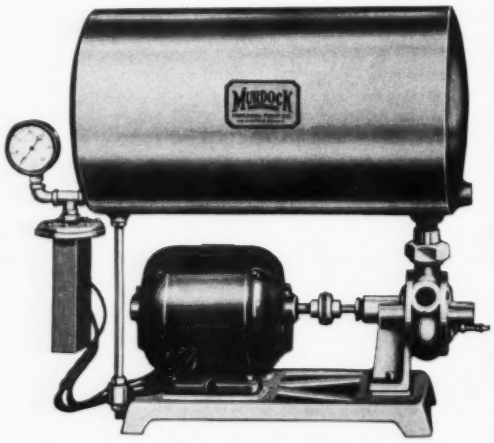

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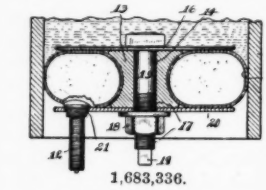
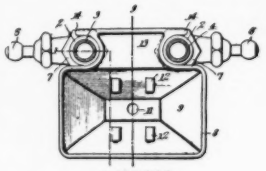
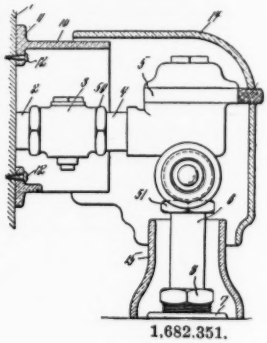
discs to said spool, said means comprising a threaded member having a shank provided with a square end in order to prevent rotation of the threaded member when adjustments thereto are desired, and means whereby said inflatable member may be expanded.

* * *

1,682,351. Flush-Valve Housing. Alfred Rogers, Milton, Mass. In combination with a wall, a pipe projecting from said wall and having a shut-off therein, a flush valve carried by said pipe, a closet, and a connection from said


1,683,336.


1,683,566


1,682,351.

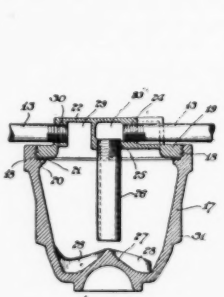
valve to said closet, of a non-corrodible housing for said pipe and valve extending from said wall to said closet and comprising a plurality of telescopically arranged sections, certain of said sections being open on one side to afford access to said shut-off.

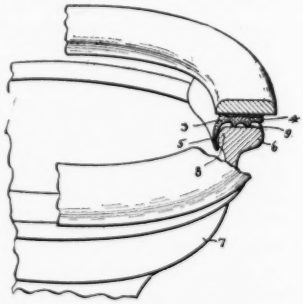
* * *

1,683,566. Soap Dish. William J. Mix, Decatur, Ill., assignor to Adolph Mueller, trustee, Decatur, Ill. A soap dish comprising a tray-like body having at its rear a portion adapted to extend between the supply pipe couplings of a double faucet and provided at opposite sides with means to loosely engage said couplings to support the tray in front of said couplings and hold it from lateral movement.

* * *

1,682,799. Sanitary Cushion Apron. Ithiel Charles Richards, Los Angeles, Calif. In a sanitary cushion apron for a toilet seat and bowl, an apron portion extending from the underside of the toilet seat into the toilet bowl to overlap the space between the seat and the bowl, and a


1,683,381.


1,682,799.

flange portion extending from the apron portion between seat and bowl and including vacuum cups formed on the underside of the flange portion adapted to adhere to the top of the bowl when pressed upon the bowl.

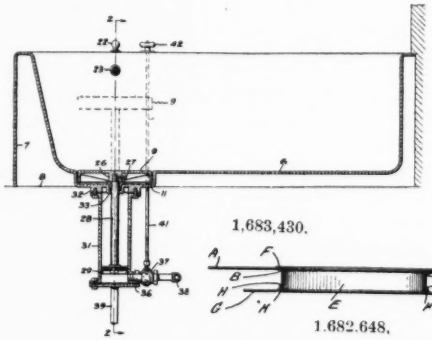
* * *

1,683,381. Water Cooler. Harry K. Bush, Pottstown, Pa., assignor to Reading Foundry & Supply Co. In a water cooler, a unit comprising a hollow frusto-conical casing integrally closed at its smaller ends, said smaller

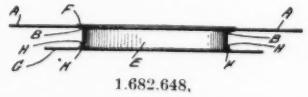
end of the casing having an internal extension and curved vanes associated therewith adapted to impart a swirling motion to water passing through the unit, a removable cap member secured in the larger end of said casing, said cap member having two chambers, an inlet pipe connected to the cap member and in communication with one of said chambers, a pipe mounted in said cap member in communication with said chamber and extending within the casing and terminating adjacent the smaller end thereof, and an outlet pipe connected to the cap member and communicating with the other chamber thereof.

* * *

1,682,648. Toilet-Seat Cover. Josephine M. Weed, New York, N. Y. A toilet-seat cover comprising a sheet of tissue paper, having an opening conforming to the opening in the seat and adapted to cover the top of the seat, a sheet of tissue paper having a similar opening and adapted to extend laterally from the opening in the seat to cover the underside of the seat, and a strip of tissue paper adapted to cover the wall of the opening extending circumferentially of the openings in the two sheets of paper and uniting them, the arrangement being such that both the upper and lower sides of the seat and the wall of the opening therein are protected with a continuous covering of tissue paper.



1,683,430.



1,682,648.

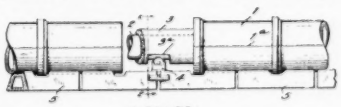
1,683,430. Bathtub Attachment. Edward A. Wright, Fresno, Calif. In a bathtub, a seat adapted to rest on the bottom thereof, a cylinder adjacent said bathtub, a piston in said cylinder directly connected to said seat for raising said seat from the bottom of said tub, and manually operated means for controlling the flow of fluid to and from said cylinder.

Heating Department

1,681,904. Welding Rod. Pliny P. Pipes, Mansfield, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio. A copper welding rod containing phosphorus between the limits of about 0.10 per cent and 0.20 per cent and tin between the limits of about 0.50 per cent and 1.00 per cent.

* * *

1,681,731. Conduit Construction for Underground Pipes. Christian Gottwald, Cleveland, Ohio, assignor to The Ric-Wil Company, Cleveland, Ohio. In combination



1,681,731.

an underground conduit for pipes comprising a conduit composed of abutting sections and having openings in the bottom thereof, conduit supporting members upon which sections of the conduit rest, and means for supporting a pipe within the conduit comprising a plurality of support-

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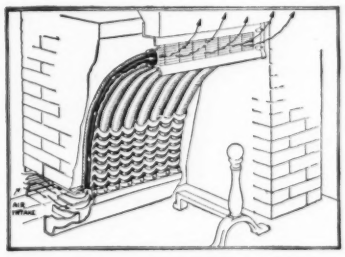

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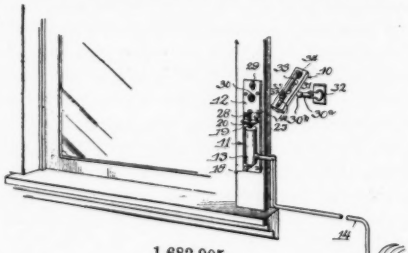
ing structures each having a saddle portion extending transversely beneath the conduit and having end portions engaging opposite side faces of the conduit supporting members and pipe supporting portions extending upwardly through said openings.

* * *

1,682,105. Insulator Fitting. Arthur O. Austin, Barberton, Ohio, assignor, by mesne assignments, to the Ohio Brass Co., Mansfield, Ohio. Connectors for insulators comprising a pair of yokes arranged to extend through openings in a pair of insulators to be connected, the ends of said yokes being bent to form hooks and plates overlapping said insulators and having openings therein for engaging said hooks to join said insulators to each other.



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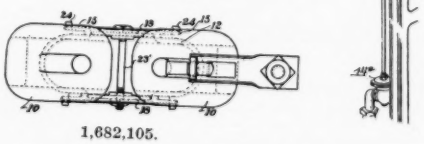
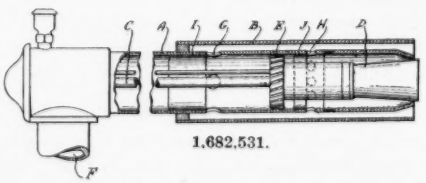


1,682,105.

1,682,905. Thermostat Control for Radiator Valves. Earl Vernon Hill, Chicago, Ill. In combination with a thermostatic member and a shut-off device to be controlled thereby, a motor member remote from said shut-off device comprising a vessel containing a liquid of low boiling point, a pipe connecting said vessel to said shut-off device for operating the same by the pressure developed in said vessel, a thermal element associated with said vessel, conductors for supplying electric current to said thermal element, one of said conductors including the thermostatic member, a normally closed make-and-break switch interposed in the other conductor, and means by which said switch is adapted to be opened upon the development of a predetermined pressure in said vessel.

* * *

1,682,531. Oil Burner. James N. Macrae, Jersey City, N. J., assignor to Petroleum Heat & Power Co., New York, N. Y. An oil burner comprising in combination, a rotary atomizer, an air-driven turbine for rotating said atomizer,



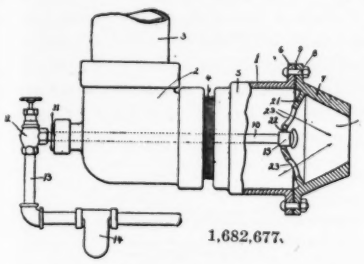
1,682,531.

an air tube within which said turbine and atomizer are mounted, a secondary air tube surrounding said first mentioned tube, means for establishing communication between the tubes at each side of said turbine, and a common source of air for supplying the secondary tube and for driving said turbine.

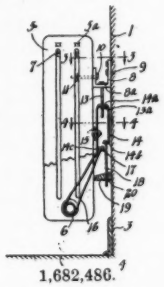
* * *

1,682,486. Radiator Hanger. James J. Conroy, St. Paul, Minn. A device adapted to support a radiator having in combination, a bracket adapted to be secured to a wall, means adapted to secure said bracket to the upper portion

of the radiator, a member carried by said bracket, means for positioning and holding said member in different vertical and lateral positions, and a flexible means carried by said member adapted to extend outwardly and downwardly from said member and about the lower portion of the radiator for supporting the same.



1,682,677.

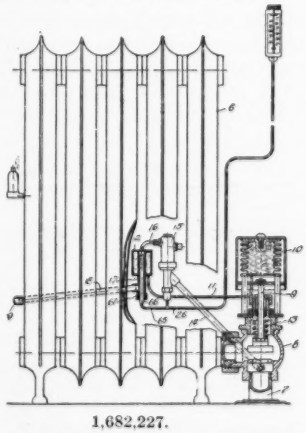


1,682,486.

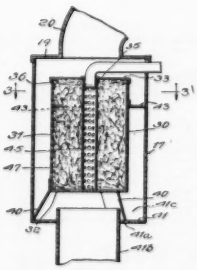
1,682,677. Oil Burner. Walter Kauffman, Columbus, Ohio. An oil burner embodying a low pressure air blast conduit, a distributing head removably carried by the outer end of said conduit and formed to include a forwardly converging mixing chamber, a wall formed integral with the inner end of said head of substantially conical form, said wall being provided with openings establishing communication between said chamber and said air blast conduit, the axes of said openings intersecting the axis of said chamber, and oil supply pipe passing longitudinally through said conduit, a spray nozzle carried by the outer end of said pipe and communicating with the inner end of said chamber, said nozzle being formed to include a discharge orifice, and a spring pressed valve serving normally to close said orifice but responsive to fluid pressures within said pipe to admit of the passage of oil through said orifice to inject the oil in spray form into said chamber.

* * *

1,682,546. Air-Conditioning Apparatus. Charles A. Bangert, Ocala, Fla. In apparatus of the kind described and in combination, a housing having an outlet opening in the lower end thereof and having an air intake opening, a tube disposed in the outlet opening and extending into the housing above the bottom wall thereof, a perforate cage within the housing and spaced from the walls thereof, porous material disposed within the cage, and means for supplying water to the porous material.



1,682,227.



1,682,546.

1,682,227. Temperature-Controlling Apparatus. Emil T. Johnsson, Chicago, Ill. In an apparatus of the character set forth, the combination of a heat exchange member, a supply for said member, a supply valve, an expansion member for opening said valve, a chamber connected with said expansion member but remote therefrom, liquid

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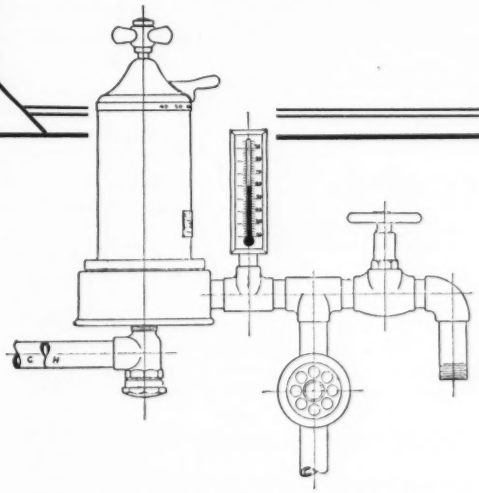

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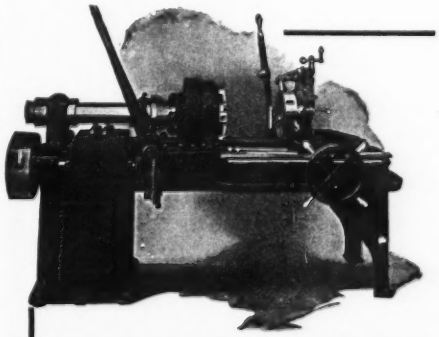

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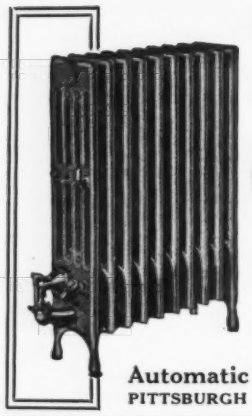

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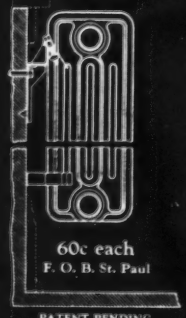

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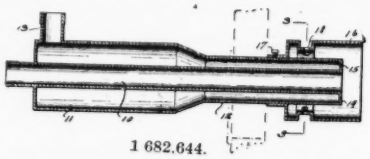
in said chamber and expansion member, a passageway from the supply through the chamber to the heat exchange member for supplying heat to said chamber, a valve for controlling said heat supply to the chamber, and thermostatic means for actuating said valve.

* * *

1,682,644. Oil Burner. Melbourne E. Vezie, Cushing, Okla. In a furnace having a fire box, an oil burner comprising a centrally disposed oil pipe, a concentrically disposed steam pipe terminating at one end with the discharge end of the oil pipe and being connected thereto at this end by an apertured wall, the apertures being arranged concentrically to the opening in the steam pipe, an

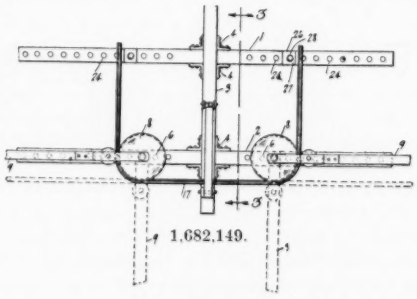


1 682.644.

air sleeve surrounding the forward end of the steam pipe and being longitudinally adjustable thereon and spaced from the steam pipe and extending beyond the same, the rear portion of the sleeve having an inwardly extending hollow rib concentric to the steam pipe and disposed closely adjacent thereto, this rib being formed with a plurality of perforations, the air inlet openings of this air sleeve being disposed within the fire box.

* * *

1,682,149. Pipe-Bending Machine. William E. Robertson, Berkeley, Calif. In a pipe bending device of the character described, two parallel bars, a cross-bar, means for clamping a pipe to the cross-bar so as to run parallel



1,682,149.

to the other bars, two pulleys adjustably pivoted on one of the parallel bars on opposite sides of the cross-bar so as to accommodate the pipe in grooves thereof, means for bending the pipe around the pulleys and stops adjustable in the second bar for limiting the turning motion of the pipe.

The ADELPHIA RESTAURANTS
"Nearest Everything" to You

Where Other Interesting People
Lunch - Dine - Dance
MAIN DINING ROOM - ROOF GARDEN
TEA ROOM - COFFEE GRILL
Children Half Price

HOTEL ADELPHIA
"Nearest Everything" - Chestnut Street at Thirteenth - Philadelphia

CHARLES ELLIS GOODIN, *President-Managing Director*

HOTEL ADELPHIA

Modern in every sense of the word, offers all of the "added features" which make up perfect service—bath with every room, circulating ice water, bed lamps, morning newspapers at "no higher" rates.

A. W. BAYLITTS, *Manager*

CLASSIFIED ADVERTISING

8 cents for each word including heading and address. Count seven words for keyed address. Minimum $2.00 for each insertion. One inch $4.00. Cash must accompany order. Copy should reach us eight days in advance.

Situations Open

EXPERIENCED SPECIALTY SALESman wanted for Illinois territory representing a well known specialty house with a full line of high quality plumbers' specialties. Fifteen (15) years established business in this territory. An unusual opening for one capable to carry on. Give full particulars for consideration. Address Key 247, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

THE HUMPHRYES MANUFACTURING Company of Mansfield, Ohio, makers of Enameled Sanitary Ware, wants a Sales Representative for the New England States. In applying please state age, experience in detail, and submit references.

SALESMEN OR DISTRIBUTORS wanted—In all territories for a line of Shower Bath Curtains to the plumbing supply trade. Commission basis. State territory covered. Address Key 246, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

TWO SALESMEN WANTED BY WELLknown boiler and radiator manufacturer for Pittsburgh and Eastern Ohio. Warehouse located in Pittsburgh. Address Key 241, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

MANUFACTURERS' REPRESentatives calling upon the plumbing and heating jobbing trade required in the following territory: Middle Western States and South, New York State, Northern Pennsylvania, New England States and Canada. Address Key 240, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

Manufacturer of pipe nipples desires to make connection with reliable manufacturers' agents, in all states, to sell nipples direct to plumbing and heating contractors. Extremely liberal commission and exclusive agency agreement. State exact territory now covering and how often. Give lines now handling and extent of acquaintanceship with plumbing and heating contractors. Also give age. Territory being allotted fast so write at once.

Address Key 203, "Domestic Engineering", 1900 Prairie Ave., Chicago

For Sale

FOR SALE AT INVOICE—THE STOCK and tools of the late Fred Fittro of Mt. Victory, consisting of Plumbing, Heating and Tinning tools; also one Clipper Well Drilling Outfit for 4-inch wells, in good condition. For particulars write Mrs. Leona Fittro, Administratrix, Mt. Victory, Ohio.

Lines to Handle

Representatives--Attention:

A very profitable connection can be offered a few well-established sales organizations outside of the largest cities by one of the leading manufacturers of Concealed Copper Radiators. In replying please give full information including experience, lines handled, and acquaintanceship with architects and the heating industry. Address Key 245, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

WANTED—WE HAVE AN EXCELlent proposition for a state representative to handle an old well advertised line of pumps, water systems and water softeners. Give experience in first letter. Address Key 152, "Domestic Engineering," 1900 Prairie Ave., Chicago.

Miscellaneous

BIG BUSINESS SAYS!

"Prepare NOW to reap YOUR share in the coming years of great business Prosperity."

HARKEN to this Command, O Ye Shop Owners, Salesmen, Mechanics, etc. Fortunes will be made in these next few years by those who KNOW. Devote this Winter to Personal Preparation in a Technical way for going after the bigger paying Jobs—the ones with the longer yearly income. Build Big with big Prosperity; Our Engineering Service is at your Command. Full information is free—check your Course, and mail today—no obligation.

- ☐ Plumbing and Sanitary Engineering.
- ☐ Special Steam and Water Heating.
- ☐ Heating Ventilating Engineering.
- ☐ Contracting and Estimating.

Saint Louis Technical Institute
Est. 1910

The most thorough institution for Technical Home Study Today

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STOP "GUESSTIMATING"
Avoid Errors and Omissions. Our
Plumbers' Estimate Sheets
will SAVE Time and Money
100 leaves in a book—4½x10
1 Book, $1.25 5 Books, $5
via Ins. Parcel Post same day we get order
LOUIS FINK & SONS CO., Printers
Time Sheets, Job Tickets, Letter Heads, etc.
School Bldg. Laurel Springs, N. J.
In Business Thirty Years. Noted for Quick Service

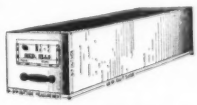
The Most Reliable
PIPE COUPLING BUYERS
in The Country

Write us about your surplus pipe couplings.

CAPITOL MFG. & SUPPLY CO.
550 Nicholas St., Columbus, O.

PLUMBERS' STOCK BOXES

Send for price list and free booklet: "How to Build Plumbers' Stock Bin Cabinets."



HADDON BIN LABEL CO., Haddon Heights, N. J.

Lines Wanted

SALESMAN COVERING OHIO, INDIana, Kentucky, Tennessee and West Virginia wants good line to sell plumbers direct or through the jobber. Acquainted with both classes of trade in territory mentioned. Address Key 233, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

Books for Your Trade Library

JOHNSON'S HANDY MANUAL IN TWO volumes, one on plumbing, one on heating. By John W. Johnson. The author is a practical plumbing and heating man, having spent many years in workshops and has superintended the installation of plumbing and heating systems of all descriptions. Twelve editions of this popular book have been exhausted. The thirteenth is just off the press. Size, 4x6¾. Cloth. Price, $1.50 per volume; two volumes, $2.50.

PRACTICAL METHODS OF SEWAGE DISPOSAL. By H. N. Ogden and H. B. Cleveland. Covers in detail the problem of sewage disposal for residences, hotels and institutions where connections to city sewers are not available. Size, 5¾x9¼ in. 132 pages. Cloth. Price, $1.50.

Books Sent Parcel Post Prepaid

Domestic Engineering
1900 Prairie Avenue, Chicago

Flush Valve Guide, Sectional

Pat'd 8-26-24

Adjustable to Any Size.

TWO LEADERS

With a National Reputation and many other exclusive items

For the Live Wire Plumbing Jobber

WRITE FOR PRICES

Leader Specialty Co., Inc., Indianapolis, Ind.

Closet Spud and Nipple Holder

Pat'd 7-15-24

Handiest Internal Gripping Tool.

Advertising Is a Specialist's Job

THE man who laid out this ad is a specialist. He knows the printer's types by their first names. He knows how to make your eye travel to the precise point he wants it to travel. He knows how to take the copy for this ad and make its essential points stand out so that you will "get them" in a glance. He knew just how this ad was going to look in type before he gave it to the printer.

The man who wrote this copy is a specialist. People say that he knows all the parts of speech in the English language. He knows enough six-cylinder words to mix with his one-cylinder words so he has what is known in baseball as a "change of pace."

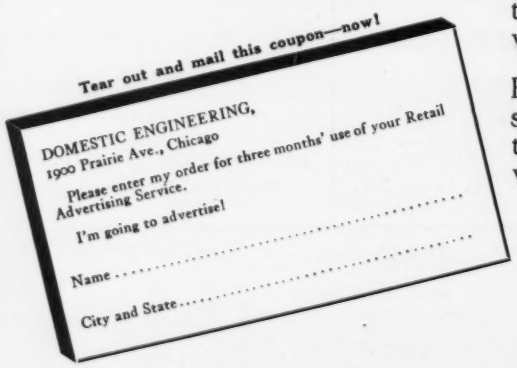
You are a specialist. You know how much radiation you will need to heat a room of a certain size, etc., and you know all about vents, and soil stacks and the other gadgets in plumbing installations.

The advertising specialists call you in when they want a plumbing or heating job they know will work. They figure, naturally, that you ought to call them in when you want an advertising job that will work.

So, each week in "Domestic Engineering" you find the Retail Advertising Service page. It carries two newspaper ads (using the same illustration in each) a sales letter and a short publicity item, made up by the two specialists mentioned with the help of a third — the artist who makes the illustration.

The cost of that service is $4.20 for twelve weeks. In other words, we charge you 35 cents for the cut each week. We send you a new illustration cut each week and a reprint of the page. All you do is hand them to your local newspaper and your advertising job for the week is finished.

Here's the form that will give you the service of these specialists for the next twelve weeks. After that you'll never want to be without their help.


Tear out and mail this coupon—now!
DOMESTIC ENGINEERING,
1900 Prairie Ave., Chicago
Please enter my order for three months' use of your Retail Advertising Service.
I'm going to advertise!
Name .....
City and State .....